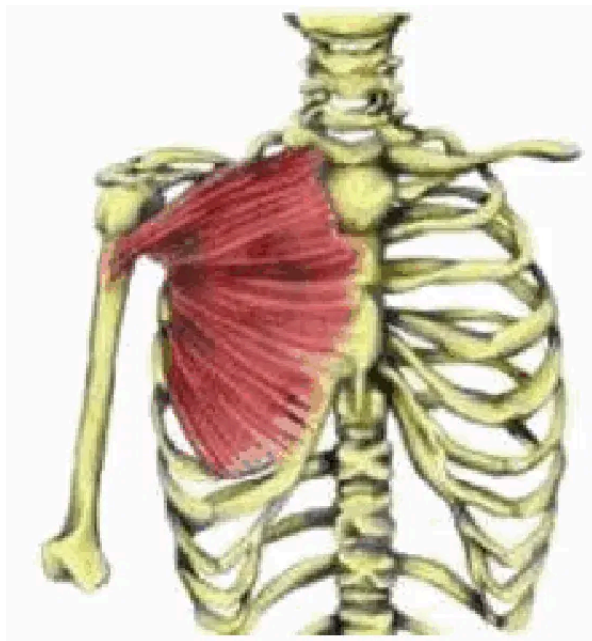


General Instructions

- (i) This booklet contains 300 questions, each provided with a complete, step-by-step solution.
- (ii) It comprises 300 single-correct multiple-choice questions.
- (iii) These questions follow the NEET PG examination pattern.
- (iv) Each correct answer is awarded +4 marks, with -1 for an incorrect answer.
- (v) The actual NEET paper has 180 questions to be attempted in 3 hours 20 minutes.
- (vi) Use of calculators is not permitted.
- (vii) Attempt each question on your own before reviewing the given solution.

1.



Identify the type of muscle shown in the image below.

- (A) Cruciate
- (B) Multipennate
- (C) Parallel
- (D) Unipennate

Correct Answer: (B) Multipennate

Solution:

Step 1: Muscles are classified by the arrangement of their fascicles relative to the tendon. Pennate muscles have fibres that lie at an angle (oblique) to the tendon, like the barbs of a feather, which packs in more fibres and increases force.

Step 2: The image shows the pectoralis major, which has several rows of diagonal fibres converging onto a single tendon. When many strips of oblique fibres feed into one central tendon, the muscle is termed multipennate. Hence the answer is multipennate.

Step 3: Why the others are wrong. Unipennate muscles have fibres on only one side of the tendon (for example extensor digitorum longus), so they look like half a feather. Parallel (strap) muscles have fibres running along the long axis of the muscle (for example sartorius). Cruciate is not a standard fascicular arrangement and is a distractor.

Quick Tip: Many oblique fibre rows feeding one tendon, as in pectoralis major.

2. Nerves of the branchial arch are derived from:

- (A) Mesoderm
- (B) Endoderm
- (C) Neural crest
- (D) Neuroectoderm

Correct Answer: (C) Neural crest

Solution:

Step 1: Branchial (pharyngeal) arches are bars of mesoderm covered externally by ectoderm and lined internally by endoderm. Within each arch develop a cartilage bar, a muscle component, an aortic arch artery and a nerve.

Step 2: The neural and glial elements of the arches arise from neural crest cells. Neural crest cells are ectoderm-derived cells that delaminate from the margins of the neural tube and migrate widely. Cranial neural crest migrates into the pharyngeal arches and forms ectomesenchyme, neurons and glia. Therefore the nerves associated with the branchial arches are of neural crest origin.

Step 3: Why the others are wrong. Mesoderm forms the muscle and the core connective tissue of the arch, not the nerves. Endoderm lines the arches and forms pharyngeal pouch derivatives. Neuroectoderm forms the central nervous system; the peripheral arch neurons and their supporting cells come specifically from neural crest.

Quick Tip: Peripheral neurons and glia of the arches are migratory crest cells.



3. The hard palate contains:

- (A) Keratinised epithelium, submucosa, minor salivary gland
- (B) Keratinised epithelium, absent submucosal layer, minor salivary gland
- (C) Non-keratinised epithelium, submucosal layer, minor salivary gland
- (D) Non-keratinised epithelium, absent submucosa, minor salivary gland

Correct Answer: (A) Keratinised epithelium, submucosa, minor salivary gland

Solution:

Step 1: The hard palate forms the roof of the oral cavity over the palatine processes of the maxilla and the horizontal plates of the palatine bones. It is the masticatory mucosa, which is built to withstand the friction of chewing.

Step 2: Being masticatory mucosa, it is lined by a keratinising (keratinised) stratified squamous epithelium that is firmly bound to the underlying periosteum. A submucosa is present, especially in the posterolateral region, and it carries vessels and the palatine (minor) salivary glands that give the orange-peel

appearance. So the correct combination is keratinised epithelium, submucosa present, minor salivary glands present.

Step 3: Why the others are wrong. Options describing a non-keratinised epithelium are incorrect because the hard palate is keratinised, unlike the lining mucosa of the cheek or floor of mouth. The option stating an absent submucosa is wrong because the submucosa, though thin centrally, is definitely present and houses salivary glands.

Quick Tip: Masticatory mucosa is keratinised and has gland-bearing submucosa posterolaterally.

4. What is the tensor of the vocal cords?

- (A) Cricothyroid
- (B) Lateral cricoarytenoid
- (C) Thyroarytenoid
- (D) Posterior cricoarytenoid

Correct Answer: (A) Cricothyroid

Solution:

Step 1: Pitch of the voice depends on the tension of the vocal folds, and the muscle that stretches and tightens them is the tensor.

Step 2: The cricothyroid muscle tilts the thyroid cartilage forward on the cricoid, lengthening and tensing the vocal folds; it is therefore the tensor of the vocal cords. It is also the only intrinsic laryngeal muscle supplied by the external laryngeal branch of the superior laryngeal nerve.

Step 3: Why the others are wrong. The thyroarytenoid relaxes (shortens) the vocal folds. The posterior cricoarytenoid is the only abductor of the cords (it opens the rima glottidis). The lateral cricoarytenoid is an adductor, not a tensor.

Quick Tip: The only cord muscle supplied by the external laryngeal nerve stretches

them.

5. The ureteric bud develops from:

- (A) Mesonephros
- (B) Metanephros
- (C) Pronephros
- (D) Genital sinus

Correct Answer: (A) Mesonephros

Solution:

Step 1: The permanent kidney (metanephros) forms from two interacting parts: the ureteric bud and the metanephric blastema. It is important to know the parent structure of each.

Step 2: The ureteric bud, also called the metanephric diverticulum, is an outgrowth from the mesonephric (Wolffian) duct near its entry into the cloaca. So the ureteric bud arises from the mesonephros / mesonephric duct, which makes mesonephros the correct answer here. The bud goes on to form the ureter, renal pelvis, calyces and collecting ducts.

Step 3: Why the others are wrong. The metanephric blastema (from metanephros) forms the nephrons, not the bud, so metanephros is the partner tissue, not the source of the bud. The pronephros is the transient, non-functional first kidney that regresses early. The genital (urogenital) sinus gives rise to the bladder and urethra, not the ureteric bud.

Quick Tip: The metanephric diverticulum sprouts from the Wolffian (mesonephric) duct.

6. Regarding Weber's syndrome, which of the following is incorrect?

- (A) Contralateral hemiplegia
- (B) Ipsilateral oculomotor nerve palsy
- (C) Contralateral parkinsonism
- (D) Anterior cerebral peduncle

Correct Answer: (D) Anterior cerebral peduncle

Solution:

Step 1: Weber's syndrome (superior alternating hemiplegia) is a midbrain stroke caused by occlusion of paramedian branches of the posterior cerebral artery or basilar bifurcation perforators. The lesion sits in the midbrain and involves the cerebral peduncle (crus cerebri) and the exiting oculomotor (third nerve) fibres.

Step 2: Classic features are an ipsilateral third nerve palsy (drooping eyelid, eye down and out, dilated fixed pupil) plus contralateral hemiplegia. Substantia nigra involvement can add contralateral parkinsonism. So the hemiplegia, the third nerve palsy and the parkinsonism statements are all correct.

Step 3: The incorrect statement is the one naming the anterior cerebral peduncle. The structure involved is the midbrain cerebral peduncle (crus cerebri), and there is no entity called the anterior cerebral peduncle as the lesion site. Hence the false option is the anterior cerebral peduncle.

Quick Tip: The lesion is the midbrain crus cerebri, not an 'anterior cerebral peduncle'.

7. Regarding Sibson's fascia, which of the following is incorrect?

- (A) Attached to the inner border of the 2nd rib
- (B) Covers the apical part of the lung
- (C) Part of the scalenus anterior muscle
- (D) Vessels pass above the fascia

Correct Answer: (A) Attached to the inner border of the 2nd rib

Solution:

Step 1: Sibson's fascia is the suprapleural membrane, a thickening of connective tissue that roofs over the cervical pleura and the apex of each lung.

Step 2: Its correct attachments are to the inner border of the first rib and to the transverse process of the C7 vertebra. It is regarded as a flattened, fascial extension of the scalenus minimus muscle, and structures such as the subclavian vessels arch above it. So the statements about covering the lung apex, being a muscular fascial extension, and vessels lying above it are essentially correct.

Step 3: The incorrect statement is that it attaches to the inner border of the second rib. The true attachment is the first rib, not the second. Hence the false option is attachment to the second rib.

Quick Tip: The suprapleural membrane grips the first rib and C7, not the second rib.

8. Thrombosis of the posterior inferior cerebellar artery causes:

- (A) Lateral medullary syndrome
- (B) Weber syndrome
- (C) Medial medullary syndrome
- (D) None

Correct Answer: (A) Lateral medullary syndrome

Solution:

Step 1: The posterior inferior cerebellar artery (PICA) is the largest branch of the vertebral artery and supplies the lateral part of the medulla as well as the inferior cerebellum.

Step 2: Occlusion of PICA (or of the vertebral artery from which it arises) produces the lateral medullary syndrome, also called Wallenberg syndrome. Features include ipsilateral facial pain and temperature loss, contralateral body pain and temperature loss, vertigo, nystagmus, dysphagia, hoarseness and ipsilateral Horner syndrome. Hence the answer is lateral medullary syndrome.

Step 3: Why the others are wrong. Weber syndrome is a midbrain lesion from posterior cerebral artery perforators (third nerve palsy with contralateral

hemiplegia). Medial medullary syndrome is caused by occlusion of the anterior spinal artery or medial vertebral branches, not PICA.

Quick Tip: PICA occlusion equals Wallenberg syndrome of the dorsolateral medulla.

9. Broca's area is situated in the:

- (A) Inferior frontal gyrus
- (B) Superior temporal gyrus
- (C) Angular gyrus
- (D) None of the above

Correct Answer: (A) Inferior frontal gyrus

Solution:

Step 1: Broca's area is the motor speech area, Brodmann area 44 (and 45), located in the frontal lobe of the dominant hemisphere, which is usually the left.

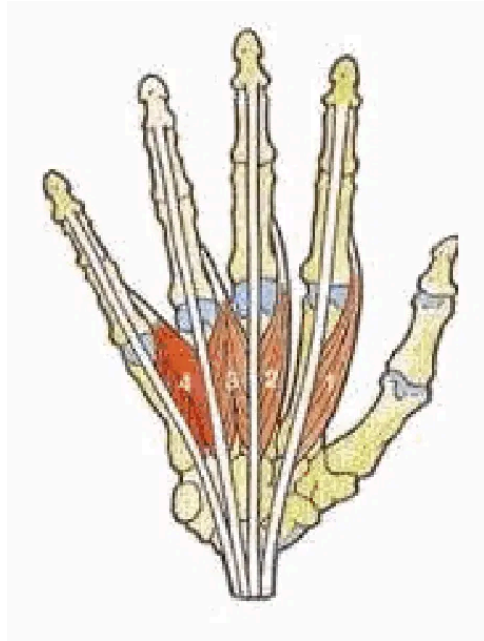
Step 2: Anatomically it occupies the pars opercularis and pars triangularis of the inferior frontal gyrus. Therefore the inferior frontal gyrus is the correct site.

Damage here causes Broca's (expressive, non-fluent) aphasia, in which comprehension is preserved but speech production is impaired.

Step 3: Why the others are wrong. The superior temporal gyrus contains Wernicke's area (receptive speech), not Broca's area. The angular gyrus is concerned with reading and writing (lesions cause alexia and agraphia), not motor speech production.

Quick Tip: Motor speech area sits in pars opercularis and triangularis of the frontal lobe.

10.



What is the function of the muscle shown in the picture?

- (A) Flexion
- (B) Extension
- (C) Adduction
- (D) Abduction

Correct Answer: (A) Flexion

Solution:

Step 1: The muscle in the image is one of the lumbricals, four small intrinsic muscles of the hand lying in the metacarpus deep to the palmar fascia. They arise from the tendons of flexor digitorum profundus and insert into the extensor expansions.

Step 2: Because of this arrangement, the lumbricals flex the metacarpophalangeal (MCP) joints while simultaneously extending the interphalangeal joints. Among the given single-word options, the action being tested is flexion (at the MCP joints), so the answer is flexion. This is the writing or 'upstroke' position of the hand.

Step 3: Why the others are wrong. Extension at the MCP joint is the opposite of

the lumbrical action there. Adduction and abduction of the fingers are produced by the palmar and dorsal interossei respectively, not by the lumbricals.

Quick Tip: Lumbricals flex the MCP joints (the writing position).

11. Acute tonsillitis affects which nerve?

- (A) Glossopharyngeal nerve
- (B) Facial nerve
- (C) Trigeminal nerve
- (D) Vagus nerve

Correct Answer: (A) Glossopharyngeal nerve

Solution:

Step 1: The palatine tonsil receives sensory supply mainly from the tonsillar branch of the glossopharyngeal nerve (cranial nerve IX), with a small contribution from the maxillary division of the trigeminal nerve.

Step 2: The glossopharyngeal nerve runs close to the tonsillar bed (the tonsillar fossa). In acute tonsillitis or during tonsillectomy this nerve is the one most likely to be irritated or injured, which is why pain can be referred to the ear (otalgia) via its tympanic branch. So the answer is the glossopharyngeal nerve.

Step 3: Why the others are wrong. The facial nerve supplies the muscles of facial expression and taste to the anterior tongue, not the tonsil. The vagus does not directly supply the palatine tonsil. The trigeminal contributes only a minor maxillary twig, which is far less commonly implicated than the glossopharyngeal nerve.

Quick Tip: Cranial nerve IX lies deep to the tonsillar fossa and refers pain to the ear.

12. Which structure does NOT pass through the aortic opening of the diaphragm?

- (A) Azygos vein
- (B) Aorta
- (C) Thoracic duct
- (D) Vagus

Correct Answer: (D) Vagus

Solution:

Step 1: The diaphragm has three major openings: the caval opening at T8, the oesophageal opening at T10, and the aortic opening (aortic hiatus) at T12. Each transmits a specific set of structures.

Step 2: The aortic hiatus at T12 transmits the aorta, the thoracic duct, the azygos vein and often the greater splanchnic nerve. So the azygos vein, aorta and thoracic duct all pass through the aortic opening, making those statements correct.

Step 3: The vagus nerve does not pass through the aortic opening. The two vagal trunks pass through the oesophageal opening (T10) along with the oesophagus and the oesophageal branches of the left gastric vessels. Therefore the structure that does not pass through the aortic opening is the vagus.

Quick Tip: The vagi pierce the T10 oesophageal opening, not the T12 aortic hiatus.

13. A newly erupted tooth is covered by:

- (A) Perikymata
- (B) Nasmyth's membrane
- (C) Fibrous tissue
- (D) All of the above

Correct Answer: (B) Nasmyth's membrane

Solution:

Step 1: When a tooth first erupts into the mouth its crown carries a thin membrane on its enamel surface. This needs to be identified.

Step 2: That covering is the primary enamel cuticle, also called Nasmyth's membrane, which is the reduced enamel epithelium left behind by the ameloblasts after enamel formation. It protects the enamel from resorption by cells of the dental sac and helps the tooth erupt without bleeding. So the newly erupted tooth is covered by Nasmyth's membrane.

Step 3: Why the others are wrong. Perikymata are the surface ridges of enamel that mark the lines of Retzius; they are a feature of enamel itself, not a covering membrane. Fibrous tissue is not the specific covering of an erupted tooth. Since only one option is correct, 'all of the above' is wrong.

Quick Tip: Reduced enamel epithelium becomes the primary enamel cuticle over the new crown.



14. What should the value of BMI be to be considered as 'lethal' in men?

- (A) 12
- (B) 18
- (C) 13
- (D) 14

Correct Answer: (C) 13

Solution:

Step 1: Body mass index (BMI) is an index of weight for height, calculated as weight in kilograms divided by the square of height in metres: $BMI = \frac{\text{weight (kg)}}{\text{height}^2 (\text{m}^2)}$. It is used to classify underweight, normal weight, overweight and obesity.

Step 2: At the lower extreme, a BMI of about 13 is regarded as the lethal lower limit for survival in men. Below this level the body fat and muscle reserves are insufficient to sustain life. Therefore the lethal BMI value in men is 13.

Step 3: Why the others are wrong. A BMI of 18 (more precisely below 18.5) marks underweight, not the lethal limit. A BMI of 12 is below the quoted male lethal figure and is closer to the limit described for women, who can survive at lower values (around 11). A BMI of 14 is above the lethal threshold for men.

Quick Tip: The lowest survivable BMI in men is around 13; women tolerate lower.

15. Which receptors are blocked in myasthenia gravis?

- (A) Acetylcholine (Ach) receptors
- (B) Ca^{2+} receptors
- (C) Na^{+} receptors
- (D) Opioid receptors

Correct Answer: (A) Acetylcholine (Ach) receptors

Solution:

Step 1: Myasthenia gravis is an autoimmune disorder of the neuromuscular junction. The body produces antibodies that target a specific component of the postsynaptic membrane.

Step 2: These autoantibodies are directed against the nicotinic acetylcholine receptors (AChRs) on the muscle end plate, blocking and destroying them and flattening the post-junctional folds. With fewer functional acetylcholine receptors, the junction cannot reliably transmit the nerve signal to the muscle, producing fluctuating weakness and fatigability that worsen with use. So the receptors blocked are the acetylcholine receptors.

Step 3: Why the others are wrong. Calcium-channel antibodies (against presynaptic voltage-gated calcium channels) characterise Lambert-Eaton myasthenic syndrome, not myasthenia gravis. Sodium and opioid receptors are not the autoimmune targets in this disease. Treatment with anticholinesterases such as neostigmine improves strength by raising synaptic acetylcholine.

Quick Tip: Autoantibodies destroy postsynaptic nicotinic acetylcholine receptors.

16. What is the characteristic pattern seen in Brown-Sequard syndrome?

- (A) Contralateral loss of joint sense and position
- (B) Contralateral loss of pain
- (C) Ipsilateral loss of complete sensory functions
- (D) Contralateral motor functions

Correct Answer: (B) Contralateral loss of pain

Solution:

Step 1: Brown-Sequard syndrome results from hemisection (transection of one side) of the spinal cord. To predict the deficits you must know which tracts cross at the cord and which cross higher up.

Step 2: The spinothalamic tract carries pain and temperature and crosses within one or two segments of entry, so a hemisection causes contralateral loss of pain and temperature beginning a few segments below the lesion. Hence the characteristic pattern in the options is contralateral loss of pain sensation, making that the answer.

Step 3: Why the others are wrong. The dorsal columns (joint position and vibration) ascend uncrossed and so are lost on the same (ipsilateral) side, not contralaterally. The corticospinal tract has already crossed in the medulla, so motor loss is ipsilateral below the lesion, not contralateral. Complete sensory loss on one side only does not fit; the deficits are split between the two sides.

Quick Tip: Spinothalamic fibres cross early, so pain loss is contralateral.

17. When is the ventilation-perfusion ratio (V_a/Q) equal to infinity?

- (A) Partial pressure of O₂ becomes zero
- (B) No exchange of O₂ and CO₂
- (C) Partial pressure of CO₂ alone becomes zero
- (D) Partial pressures of both CO₂ and O₂ remain normal

Correct Answer: (B) No exchange of O₂ and CO₂

Solution:

Step 1: The ventilation-perfusion ratio is $\frac{V_A}{Q}$, where V_A is alveolar ventilation and Q is the alveolar blood flow (perfusion). The ratio describes how well ventilation is matched to perfusion in an alveolus.

Step 2: When $\frac{V_A}{Q}$ tends to infinity, the denominator (perfusion) approaches zero while ventilation continues. This is alveolar dead space: air enters the alveolus but no blood flows past it, so there is no exchange of oxygen and carbon dioxide across the respiratory membrane. Hence the answer is 'no exchange of O₂ and CO₂'.

Step 3: Why the others are wrong. With no perfusion the alveolar gas simply equilibrates with humidified inspired air, so the alveolar oxygen stays high (about 149 mmHg) rather than falling to zero, and the carbon dioxide falls to about 0 mmHg only as a consequence of the absent exchange. The defining feature being tested is the loss of gas exchange itself, not any single normal pressure value.

Quick Tip: Infinite V_A/Q means dead space - ventilation without perfusion, so no gas exchange.

18. The 'c' wave of the jugular venous pulse is seen in:

- (A) Isovolumetric contraction
- (B) Slow filling at the end of diastole
- (C) End of systole
- (D) Start of diastole

Correct Answer: (A) Isovolumetric contraction

Solution:

Step 1: The jugular venous pulse reflects right atrial pressure changes. It has three positive waves (a, c and v) and two negative descents (x and y), each tied to an event in the cardiac cycle.

Step 2: The 'c' wave is produced by the bulging of the closed tricuspid valve back into the right atrium during isovolumetric (isovolumic) ventricular contraction, when ventricular pressure rises sharply but the semilunar valves have not yet opened. Therefore the c wave corresponds to isovolumetric contraction, which is the answer.

Step 3: Why the others are wrong. The 'a' wave is atrial contraction (late diastole). The 'v' wave occurs at the end of systole due to atrial filling against a closed tricuspid valve. The slow-filling phase and the start of diastole relate to the y descent, not the c wave.

Quick Tip: The c wave is the tricuspid valve bulging during isovolumic contraction.

19. Alpha waves on the EEG are seen during which state?

- (A) Sleep
- (B) REM movements
- (C) Relaxed state
- (D) Active state

Correct Answer: (C) Relaxed state

Solution:

Step 1: The EEG shows different waveforms depending on the level of cortical activity, classified mainly as alpha, beta, theta and delta waves by frequency.

Step 2: Alpha waves have a frequency of about 8 to 13 Hz and an amplitude of roughly 50 to 100 microvolts. They are the normal background rhythm recorded when a person is awake, at rest and relaxed with the eyes closed and the mind

wandering. So alpha waves correspond to the relaxed state, which is the answer.

Step 3: Why the others are wrong. Active mental concentration or an alert, eyes-open state produces faster, low-amplitude beta waves. Sleep is dominated by slower theta and delta waves. REM sleep shows a low-voltage fast pattern resembling wakefulness, not the alpha rhythm of quiet relaxation.

Quick Tip: 8-13 Hz alpha rhythm appears awake, relaxed, with eyes closed.

20. In hypovolemic shock, there is:

- (A) Afferent arteriolar constriction
- (B) Efferent arteriolar constriction
- (C) Increased blood flow to the kidney
- (D) Normal cardiac output

Correct Answer: (A) Afferent arteriolar constriction

Solution:

Step 1: Hypovolemic shock is caused by inadequate circulating blood volume (from haemorrhage, fluid or salt and water loss, burns or sepsis). Poor venous return lowers stroke volume and cardiac output.

Step 2: The body compensates with sympathetic activation - tachycardia and a generalised rise in systemic vascular resistance, including intense renal vasoconstriction. At the kidney the afferent arteriole constricts, reducing renal blood flow and helping divert blood to vital organs. So the correct statement is afferent arteriolar constriction.

Step 3: Why the others are wrong. Renal blood flow falls rather than increases in shock, so 'increased blood flow to the kidney' is wrong. Cardiac output is reduced, not normal. While angiotensin II preferentially constricts the efferent arteriole to defend filtration, the dominant sympathetic response in shock constricts the afferent arteriole, cutting overall renal flow.

Quick Tip: Sympathetic drive in shock constricts the renal afferent arteriole, cutting renal flow.

21. The components responsible for the counter-current mechanism in the kidney are all of the following EXCEPT:

- (A) Sodium outflow in the thick ascending limb
- (B) Water outflow in the thin descending limb
- (C) Sodium outflow in the thin ascending limb
- (D) Flow of tubular fluid from PCT to DCT

Correct Answer: (C) Sodium outflow in the thin ascending limb

Solution:

Step 1: The counter-current mechanism builds and maintains the medullary osmotic gradient through the loop of Henle (a counter-current multiplier) and the vasa recta (a counter-current exchanger).

Step 2: The genuine components include active sodium reabsorption (sodium outflow), with co-transport of potassium and chloride, in the thick ascending limb, and passive water reabsorption (water outflow) in the thin descending limb. The continuous flow of tubular fluid along the loop, from the proximal toward the distal tubule, is also essential for the system to operate. These are all correct contributors.

Step 3: The thin ascending limb is impermeable to water and reabsorbs sodium chloride passively, but the active, energy-using sodium pump (the single effect that drives the multiplier) is located in the thick ascending limb, not the thin ascending limb. The statement 'sodium outflow in the thin ascending limb' as a primary active component is therefore the exception and is the answer.

Quick Tip: The active sodium pump (single effect) is in the thick, not the thin, ascending limb.

22. Glucose is absorbed in the intestine by which transport mechanism?

- (A) Secondary active transport
- (B) Facilitated diffusion
- (C) Simple diffusion
- (D) Primary active transport

Correct Answer: (B) Facilitated diffusion

Solution:

Step 1: Glucose enters the enterocyte across the apical (luminal) membrane against its concentration gradient using the sodium-glucose linked transporter SGLT1. This is secondary active transport, powered indirectly by the Na^+/K^+ ATPase pump.

Step 2: Once inside the cell, glucose has to leave across the basolateral membrane to reach the blood. This exit step uses the GLUT2 carrier and moves glucose down its concentration gradient. Movement of a large water-soluble molecule through a specific carrier protein, without using energy, is the definition of facilitated diffusion.

Step 3: When the question asks how glucose is "absorbed" with facilitated diffusion as an option, it is pointing to the carrier-mediated, energy-independent GLUT step, so the correct answer is facilitated diffusion.

Step 4: Simple diffusion is wrong because glucose is polar and cannot cross the lipid bilayer freely. Primary active transport directly hydrolyses ATP at the transporter itself, which glucose carriers do not do.

Quick Tip: Think of the carrier that moves a large polar sugar down its gradient without spending ATP.

23. Insulin-like growth factor (IGF) is secreted mainly by which organ?

- (A) Liver
- (B) Pituitary gland
- (C) Pancreas
- (D) Adrenal glands

Correct Answer: (A) Liver

Solution:

Step 1: Growth hormone (GH) is released by the anterior pituitary, but many of its growth-promoting actions are not direct. GH travels to the liver and stimulates it to produce small peptides called somatomedins.

Step 2: Because these somatomedins have actions similar to insulin, they are called insulin-like growth factors. The most important one is somatomedin C, also named IGF-1, which drives bone and tissue growth.

Step 3: IGF-1 binds to carrier proteins in blood, giving it a long half-life of about 20 hours versus roughly 20 minutes for GH. Its blood level tracks GH secretion.

Step 4: Since the liver is the principal site of IGF synthesis, the answer is liver. The pituitary makes GH (not IGF directly), the pancreas makes insulin, and the adrenal glands make steroids and catecholamines.

Quick Tip: Growth hormone acts on this organ to make somatomedins.

24. What is prosopagnosia?

- (A) Impairment of consciousness
- (B) Being unaware of one's own problems
- (C) Difficulty in identifying known faces
- (D) Failure to identify objects

Correct Answer: (C) Difficulty in identifying known faces

Solution:

Step 1: Prosopagnosia is a specific agnosia in which a person cannot recognise familiar faces, even those of close family or their own face, despite intact vision and intelligence.

Step 2: It results from damage to the fusiform face area in the inferior temporal-occipital cortex, typically the right or bilateral fusiform gyrus. So the correct option is difficulty in identifying known faces.

Step 3: The distractors describe other deficits. Impairment of consciousness is a global change in awareness, not a recognition problem. Being unaware of one's own deficit is anosognosia. Inability to identify objects is visual object agnosia, a different category.

Step 4: Keep the terms separate: face blindness equals prosopagnosia, while object blindness equals object agnosia.

Quick Tip: The word starts with the Greek root for "face".

25. Transport across the nucleus is carried out by all of the following except?

- (A) Caveolins
- (B) Local signals
- (C) Importins
- (D) Rat proteins

Correct Answer: (D) Rat proteins

Solution:

Step 1: Movement of molecules in and out of the nucleus happens through the nuclear pore complex and depends on carrier proteins called karyopherins, plus localisation signals on the cargo.

Step 2: Importins are karyopherins that carry proteins into the nucleus by binding their nuclear localisation sequences (NLS); they work with subunits importin alpha and importin beta. Local signals such as the NLS and nuclear export signal direct this traffic. Caveolins, while mainly plasma-membrane proteins, are also described in nucleocytoplasmic shuttling pathways.

Step 3: "Rat proteins" is not a recognised nuclear transport molecule. The phrase refers to recombinant rat proteins used in cell culture, with no role in nuclear import or export.

Step 4: Therefore the exception, the one not involved in nuclear transport, is rat proteins.

Quick Tip: Three options are real transport machinery; one is a lab reagent term.



26. Iron is taken up from the gut lumen into enterocytes through which transporter?

- (A) DMT1
- (B) DMT2
- (C) Ferroportin 1
- (D) GLUT1

Correct Answer: (A) DMT1

Solution:

Step 1: Dietary iron in the ferrous form is moved from the intestinal lumen into the enterocyte across the apical (brush-border) membrane by an active transport carrier.

Step 2: That carrier is DMT1 (Divalent Metal Transporter 1), expressed on the apical surface of enterocytes in the upper duodenum. So the answer is DMT1.

Step 3: DMT1 is not iron-specific; it can also transport zinc, copper, cobalt and manganese.

Step 4: The distractors are wrong: there is no important "DMT2" iron transporter, ferroportin 1 exports iron out of the cell at the basolateral membrane (it does not take iron in), and GLUT1 carries glucose, not iron.

Quick Tip: Apical entry uses a divalent metal transporter; the basolateral exporter is the trap.



27. Serotonin is also known as?

- (A) 5-hydroxytryptamine (5-HT)
- (B) N-methyl phenylamine
- (C) 3-Methoxytyramine
- (D) Phenethylamine

Correct Answer: (A) 5-hydroxytryptamine (5-HT)

Solution:

Step 1: Serotonin is a monoamine neurotransmitter synthesised from the amino acid tryptophan. Tryptophan is first hydroxylated, then decarboxylated, giving a molecule with a hydroxyl group at position 5 of the indole ring.

Step 2: Because of this structure its chemical name is 5-hydroxytryptamine, abbreviated 5-HT. So the correct answer is 5-hydroxytryptamine.

Step 3: The other options belong to different molecules: 3-methoxytyramine is a dopamine metabolite, while phenethylamine and N-methyl phenylamine are unrelated phenethylamine-class compounds, none of which is serotonin.

Quick Tip: It is the indole amine made from tryptophan, hydroxylated at position 5.

28. Tyrosinosis is caused due to deficiency of which enzyme?

- (A) Fumarylacetoacetate hydrolase
- (B) p-hydroxyphenylpyruvate dehydrogenase
- (C) Tyrosine transaminase
- (D) Tyrosine ligase

Correct Answer: (A) Fumarylacetoacetate hydrolase

Solution:

Step 1: Tyrosinosis, also called hepatorenal tyrosinemia or tyrosinemia type I, is the most severe disorder of tyrosine metabolism, causing buildup of tyrosine and its toxic intermediates in blood and tissues.

Step 2: The block is in the final step of the tyrosine degradation pathway, catalysed by fumarylacetoacetate hydrolase (FAH). Deficiency of this enzyme is the cause, so the answer is fumarylacetoacetate hydrolase.

Step 3: Loss of FAH leads to accumulation of fumarylacetoacetate and succinylacetone, which damage the liver and kidneys.

Step 4: The other enzymes act earlier in the pathway: tyrosine transaminase deficiency causes tyrosinemia type II, and p-hydroxyphenylpyruvate dehydrogenase (dioxygenase) deficiency causes type III; "tyrosine ligase" is not a step in this pathway.

Quick Tip: The defect is in the final step of tyrosine breakdown.

29. Lesch-Nyhan syndrome is caused by deficiency of which enzyme?

- (A) Orotate phosphoribosyltransferase
- (B) Uracil phosphoribosyltransferase
- (C) Quinolate phosphoribosyltransferase
- (D) Hypoxanthine-guanine phosphoribosyltransferase (HGPRT)

Correct Answer: (D) Hypoxanthine-guanine phosphoribosyltransferase (HGPRT)

Solution:

Step 1: Lesch-Nyhan syndrome is an X-linked recessive disorder of purine metabolism caused by a defect in the salvage pathway. It results from mutations in the HPRT gene on the X chromosome.

Step 2: The deficient enzyme is hypoxanthine-guanine phosphoribosyltransferase (HGPRT), which normally recycles hypoxanthine and guanine back into nucleotides. So the answer is HGPRT.

Step 3: Without salvage, hypoxanthine and guanine are diverted to uric acid, causing hyperuricemia (juvenile gout), along with self-mutilation, choreoathetosis and intellectual disability.

Step 4: The other enzymes belong to pyrimidine or NAD pathways: orotate and uracil phosphoribosyltransferases relate to pyrimidine metabolism, and quinolate phosphoribosyltransferase is in NAD synthesis, so none of these causes Lesch-Nyhan syndrome.

Quick Tip: Think of the purine salvage enzyme on the X chromosome linked to juvenile gout.

30. Fish odour syndrome is caused by deficiency of which enzyme?

- (A) Fumarylacetoacetate hydrolase
- (B) Methane monooxygenase
- (C) Flavin-containing monooxygenase 3 (FMO3)
- (D) D-amino acid oxidase

Correct Answer: (C) Flavin-containing monooxygenase 3 (FMO3)

Solution:

Step 1: Fish odour syndrome, or trimethylaminuria, is a metabolic disorder in which the body cannot properly process the smelly compound trimethylamine (TMA) derived from dietary precursors such as choline.

Step 2: Normally the enzyme flavin-containing monooxygenase 3 (FMO3) converts odourless TMA into odourless trimethylamine oxide (TMAO) by N-oxidation. Deficiency of FMO3 is the cause, so the answer is FMO3.

Step 3: When FMO3 is deficient, TMA accumulates and is excreted in sweat, urine and breath, producing a strong fishy body odour.

Step 4: The distractors are unrelated: fumarylacetoacetate hydrolase deficiency causes tyrosinemia, methane monooxygenase is a bacterial enzyme, and D-amino acid oxidase deficiency does not cause this condition.

Quick Tip: An enzyme that N-oxidises trimethylamine is missing.

31. Classic galactosemia is due to deficiency of which enzyme?

- (A) Galactose-1-phosphate uridylyltransferase
- (B) HGPRT
- (C) Galactokinase
- (D) Epimerase

Correct Answer: (A) Galactose-1-phosphate uridylyltransferase

Solution:

Step 1: Galactosemia is an autosomal recessive disorder in which galactose, mainly from milk lactose, cannot be properly converted to glucose for use.

Step 2: The classic and most severe form is caused by deficiency of galactose-1-phosphate uridylyltransferase (GALT), the central enzyme of the Leloir pathway. So the answer is galactose-1-phosphate uridylyltransferase.

Step 3: GALT deficiency leads to accumulation of galactose-1-phosphate, which is toxic to the liver, brain and kidney, and excess galactitol in the lens causing cataracts.

Step 4: The distractors give milder or different conditions: galactokinase deficiency causes a milder variant with mainly cataracts, epimerase deficiency is a third variant, and HGPRT belongs to purine metabolism (Lesch-Nyhan), not galactose handling.

Quick Tip: The central Leloir-pathway transferase is missing in the classic severe form.



32. Which of the following is the most abundant end product of fatty acid synthesis?

- (A) Oleic acid
- (B) Palmitic acid
- (C) Arachidonic acid
- (D) Glucose

Correct Answer: (B) Palmitic acid

Solution:

Step 1: De novo fatty acid synthesis occurs in the cytoplasm (extramitochondrial system) of tissues such as liver, kidney, brain, lung, mammary gland and adipose tissue, using acetyl-CoA as the immediate substrate.

Step 2: The fatty acid synthase complex adds two-carbon units repeatedly until it produces a 16-carbon saturated fatty acid. The chief end product released is palmitic acid (palmitate). So the answer is palmitic acid.

Step 3: Palmitate can later be elongated (to stearate) or desaturated (to oleic acid), but those are downstream modifications, not the primary product.

Step 4: Arachidonic acid is a polyunsaturated fatty acid derived from linoleic acid, and glucose is a carbohydrate, not a fatty acid product, so both are wrong.

Quick Tip: Fatty acid synthase releases a 16-carbon saturated acid.



33. Regarding DNA polymerase I, which one of the following is correct?

- (A) Not required in bacteria
- (B) Repairs any damage within DNA
- (C) Involved in Okazaki fragment processing
- (D) Participates in DNA replication

Correct Answer: (B) Repairs any damage within DNA

Solution:

Step 1: DNA polymerase I is a prokaryotic enzyme with polymerase, 5'-to-3' exonuclease and 3'-to-5' proofreading exonuclease activities. Its main role is in DNA repair.

Step 2: Its principal function is to repair damage within DNA. It also removes RNA primers and fills the gaps between Okazaki fragments, after which DNA ligase seals the nicks. So the correct statement is that it repairs damage within DNA.

Step 3: The actual processive enzyme of bacterial replication is DNA polymerase

III, not Pol I, so calling Pol I the main replication enzyme is misleading. Pol I is certainly required in bacteria, so the option "not required in bacteria" is false.

Step 4: Among the choices given, the single most accurate statement about Pol I is that its principal job is repair, hence that option is selected.

Quick Tip: This polymerase is the repair and primer-removal enzyme, not the main replicase.



34. What do chaperones assist in?

- (A) Protein cleavage
- (B) Protein folding
- (C) Protein degradation
- (D) Protein modification

Correct Answer: (B) Protein folding

Solution:

Step 1: Molecular chaperones are proteins that help newly made polypeptides fold into their correct three-dimensional shape inside the cell.

Step 2: They do this by preventing inappropriate aggregation and by shielding hydrophobic regions until the protein reaches its native conformation; many use ATP for repeated binding and release. So chaperones assist in protein folding.

Step 3: Examples include heat shock proteins such as Hsp70 and Hsp60 (chaperonins like GroEL/GroES).

Step 4: The distractors describe other processes: cleavage and degradation are done by proteases and the proteasome, and modification (such as phosphorylation or glycosylation) is carried out by different specific enzymes, not by chaperones.

Quick Tip: Heat shock proteins guide a new polypeptide into its correct shape.

35. A fishy body odour can occur due to dietary deficiency of which vitamin?

- (A) Biotin
- (B) Thiamine
- (C) Riboflavin
- (D) Vitamin A

Correct Answer: (C) Riboflavin

Solution:

Step 1: The enzyme that normally clears odourous trimethylamine (TMA) is flavin-containing monooxygenase 3 (FMO3), and like all flavin enzymes it depends on flavin cofactors (FAD/FMN).

Step 2: These flavin cofactors are derived from riboflavin (vitamin B2). When riboflavin is deficient, FMO3 activity falls, TMA accumulates, and a fishy odour appears. So the answer is riboflavin.

Step 3: This links a dietary cause (low riboflavin) to the same fishy-odour mechanism seen in genetic trimethylaminuria.

Step 4: The other vitamins are not involved in this pathway: biotin is a carboxylation cofactor, thiamine works in decarboxylation reactions, and vitamin A is for vision and epithelial health, none of which controls TMA oxidation.

Quick Tip: FMO3 needs a flavin cofactor that comes from this B vitamin.

36. Vanillylmandelic acid (VMA) is excreted in urine in which condition?

- (A) Alkaptonuria
- (B) Phenylketonuria
- (C) Pheochromocytoma
- (D) Diabetic ketoacidosis

Correct Answer: (C) Pheochromocytoma

Solution:

Step 1: VMA is the major end product of catecholamine (epinephrine and norepinephrine) breakdown and is excreted in urine.

Step 2: In pheochromocytoma (and neuroblastoma), tumour cells overproduce catecholamines, so their metabolism generates large amounts of VMA, raising urinary VMA. So the answer is pheochromocytoma.

Step 3: Urinary VMA is therefore a useful screening test for pheochromocytoma and for following neuroblastoma and ganglioneuroma.

Step 4: The distractors raise different metabolites: alkaptonuria raises homogentisic acid, phenylketonuria raises phenylpyruvate and phenyllactate, and diabetic ketoacidosis raises ketone bodies, none of which is VMA.

Quick Tip: VMA is a catecholamine metabolite, so think of a catecholamine-secreting tumour.

37. All of the following are excreted in excess in cystinuria except?

- (A) Cystine
- (B) Cysteine
- (C) Arginine
- (D) Ornithine

Correct Answer: (B) Cysteine

Solution:

Step 1: Cystinuria is an autosomal recessive defect of the renal tubular and intestinal transporter that normally reabsorbs the dibasic amino acids. The affected amino acids are cystine, ornithine, lysine and arginine (remembered as COLA).

Step 2: Because their reabsorption fails, cystine, ornithine, lysine and arginine all appear in increased amounts in the urine. Cystine is poorly soluble and precipitates as hexagonal crystals, forming kidney stones.

Step 3: Cysteine, the reduced single-amino-acid form, is not the amino acid handled by this transporter; the transporter and the disease involve cystine (two cysteines joined by a disulfide bond), not free cysteine. So the exception is cysteine.

Step 4: Therefore arginine and ornithine are correctly excreted in excess, while cysteine is the one that is not the characteristic urinary amino acid here.

Quick Tip: Remember COLA, and note the dimer cystine versus the single amino acid cysteine.

38. Fibrinopeptide A and fibrinopeptide B are acidic due to the presence of which amino acids in their structure?

- (A) Serine and threonine
- (B) Glutamate and aspartate
- (C) Histidine and lysine
- (D) Glutamine and valine

Correct Answer: (B) Glutamate and aspartate

Solution:

Step 1: Fibrinopeptides A and B are short peptides cleaved from the amino-terminal ends of the alpha and beta chains of fibrinogen by thrombin during clot formation.

Step 2: These peptides are rich in acidic amino acids, namely glutamate and aspartate, whose carboxyl side chains give them an overall acidic (negatively charged) character. So the answer is glutamate and aspartate.

Step 3: Their high negative charge is thought to help keep fibrinogen soluble; once thrombin removes them, fibrin monomers can polymerise into a clot.

Step 4: The distractors are not acidic: serine and threonine are neutral hydroxyl amino acids, histidine and lysine are basic, and glutamine and valine are neutral, so none of these explains the acidic nature.

Quick Tip: Acidic side chains mean the carboxyl-bearing amino acids.



39. 5-hydroxyindoleacetic acid (HIAA) is present in urine in which condition?

- (A) Alkaptonuria
- (B) Albinism
- (C) Carcinoid syndrome
- (D) Phenylketonuria

Correct Answer: (C) Carcinoid syndrome

Solution:

Step 1: 5-hydroxyindoleacetic acid (5-HIAA) is the main urinary breakdown product of serotonin (5-HT).

Step 2: Carcinoid tumours secrete large amounts of serotonin and other vasoactive substances, producing carcinoid syndrome with flushing, abdominal cramps and diarrhoea. The excess serotonin is metabolised to 5-HIAA, which

rises in urine. So the answer is carcinoid syndrome.

Step 3: Measuring 24-hour urinary 5-HIAA is the standard biochemical test to diagnose carcinoid syndrome.

Step 4: The distractors involve other pathways: alkaptonuria raises homogentisic acid, albinism is a defect of melanin synthesis (tyrosinase), and phenylketonuria raises phenylketones, none of which produces 5-HIAA.

Quick Tip: 5-HIAA is a serotonin metabolite, so think of a serotonin-secreting tumour.



40. Warthin-Finkeldey cells are seen in which disease?

- (A) Measles
- (B) Rubella
- (C) Rabies
- (D) Typhoid

Correct Answer: (A) Measles

Solution:

Step 1: Warthin-Finkeldey cells are multinucleated giant cells classically associated with measles infection.

Step 2: Measles virus invades respiratory epithelium, multiplies locally, then spreads via viremia to the reticuloendothelial system. In the prodromal phase it produces multinucleated giant cells, including Warthin-Finkeldey cells in lymphoid tissue. So the answer is measles.

Step 3: Under the microscope these cells show a large grape-like cluster of nuclei. They are found in hyperplastic lymph nodes early in measles, and can also be seen in HIV infection and Kimura disease.

Step 4: The distractors have other markers: rubella, rabies (Negri bodies in neurons) and typhoid (typhoid nodules with macrophages) do not feature Warthin-Finkeldey cells.

Quick Tip: Grape-like multinucleated giant cells in lymph nodes point to a classic viral exanthem.



41. CD59 is a marker of which disease?

- (A) Paroxysmal nocturnal hemoglobinuria (PNH)
- (B) PTEN syndrome
- (C) BRR syndrome
- (D) Cowden syndrome

Correct Answer: (A) Paroxysmal nocturnal hemoglobinuria (PNH)

Solution:

Step 1: Paroxysmal nocturnal hemoglobinuria (PNH) is caused by an acquired mutation in the PIGA gene, which is needed to make the glycosylphosphatidylinositol (GPI) anchor.

Step 2: Without the GPI anchor, several surface proteins cannot attach to blood cells. Two important ones are the complement-regulatory proteins CD55 (DAF) and CD59 (MIRL). Deficiency of CD59 (and CD55) makes red cells highly susceptible to complement-mediated lysis. So CD59 is the marker of PNH.

Step 3: Diagnosis relies on flow cytometry showing loss of CD55 and CD59 on red and white cells, confirming increased complement sensitivity.

Step 4: The distractors are PTEN-related hamartoma conditions: Cowden syndrome and Bannayan-Riley-Ruvalcaba (BRR) syndrome arise from PTEN mutations, not from CD59 deficiency.

Quick Tip: Loss of a GPI-anchored complement regulator points to a hemolytic disease.

42. Which complement component acts as an opsonin?

- (A) C3a
- (B) C3b
- (C) C5a
- (D) C6

Correct Answer: (B) C3b

Solution:

Step 1: Opsonisation is the coating of a foreign particle so that phagocytes can recognise and engulf it. The coating molecules are called opsonins.

Step 2: C3 is the most abundant complement protein and is cleaved into C3a and C3b. The fragment that attaches to bacterial surfaces and tags them for phagocytosis is C3b. So C3b is the opsonin and the correct answer.

Step 3: Other complement opsonins include iC3b and C4b, and antibodies (IgG) also act as opsonins.

Step 4: The distractors have different roles: C3a and C5a are anaphylatoxins that trigger mast cell and basophil histamine release and chemotaxis, and C6 is part of the membrane attack complex, not an opsonin.

Quick Tip: The larger cleavage fragment of C3 coats bacteria for phagocytosis.

43. Bernard-Soulier syndrome is due to a deficiency of which platelet glycoprotein?

- (A) Gp IIb/IIIa
- (B) Gp Ib
- (C) von Willebrand factor (vWF)
- (D) TNF

Correct Answer: (B) Gp Ib

Solution:

Step 1: Bernard-Soulier syndrome (BSS) is a rare autosomal recessive bleeding disorder of platelet adhesion. **Step 2:** The defect is a deficiency or dysfunction of the platelet membrane glycoprotein Ib-IX-V complex (Gp Ib), which is the receptor for von Willebrand factor. **Step 3:** Because platelets cannot bind vWF on the damaged subendothelium, platelet adhesion fails, producing giant platelets, thrombocytopenia and prolonged bleeding time. **Step 4:** Gp IIb/IIIa deficiency is Glanzmann thrombasthenia (an aggregation defect), vWF deficiency itself is von Willebrand disease, and TNF is a cytokine unrelated to this platelet defect. Hence the answer is Gp Ib.

Quick Tip: Think of the platelet receptor that grabs von Willebrand factor for adhesion.

44. Cowden syndrome is associated with mutation of which gene?

- (A) P53
- (B) PTEN
- (C) Rb
- (D) Ras

Correct Answer: (B) PTEN

Solution:

Step 1: Cowden syndrome (multiple hamartoma syndrome) is an autosomal dominant condition and part of the PTEN hamartoma tumour syndrome. **Step 2:**

It is caused by germline mutation of the PTEN gene, which normally acts as a tumour-suppressor phosphatase. Loss of PTEN function promotes uncontrolled cell growth. **Step 3:** Clinically it produces facial trichilemmomas, multiple GI hamartomatous polyps, and a very high lifetime risk of breast and thyroid carcinoma. **Step 4:** P53 (Li-Fraumeni), Rb (retinoblastoma) and Ras (a proto-oncogene) are other cancer genes but are not the defect in Cowden syndrome. Hence PTEN is correct.

Quick Tip: A tumour-suppressor phosphatase linked to hamartomas and breast or thyroid cancer.

45. The chromosome involved in myotonic dystrophy is:

- (A) Chromosome 19
- (B) Chromosome 20
- (C) Chromosome 21
- (D) Chromosome 22

Correct Answer: (A) Chromosome 19

Solution:

Step 1: Myotonic dystrophy type 1 is an autosomal dominant disorder and the most common adult muscular dystrophy. **Step 2:** It is caused by an unstable expanded CTG trinucleotide repeat in the DMPK gene located at 19q13.3, so the involved chromosome is 19. **Step 3:** Characteristic features include distal (rather than proximal) myopathy, selective involvement of type I fibres, and myotonia such as slow release of hand grip after a forced voluntary closure. **Step 4:** Chromosomes 20, 21 and 22 are not linked to this trinucleotide repeat disorder, so the answer is chromosome 19.

Quick Tip: CTG repeat in the DMPK gene on the long arm of this chromosome.

46. TRALI (transfusion-related acute lung injury) occurs within how many hours of transfusion?

- (A) 48 hours
- (B) 72 hours
- (C) 6 hours
- (D) 12 hours

Correct Answer: (C) 6 hours

Solution:

Step 1: Transfusion-Related Acute Lung Injury (TRALI) is an acute respiratory distress syndrome that develops during or shortly after a blood transfusion. **Step 2:** By definition the onset is within 6 hours of transfusion, so the correct option is 6 hours. **Step 3:** It presents with rapid dyspnoea, tachypnoea, fever, cyanosis and hypotension, with bilateral non-cardiogenic pulmonary oedema on the chest X-ray (white-out) and no signs of circulatory overload or CHF. **Step 4:** The longer windows of 12, 48 or 72 hours do not match the accepted definition, which fixes the cut-off at 6 hours.

Quick Tip: Acute lung injury defined by onset within a short single-digit window after transfusion.

47. How does the kidney respond to shock?

- (A) Decreases renal blood flow
- (B) Increases afferent arteriole resistance
- (C) GFR remains unaltered
- (D) Perfusion of the kidney increases

Correct Answer: (B) Increases afferent arteriole resistance

Solution:

Step 1: In shock there is a fall in effective circulating blood volume, which triggers sympathetic and renin-angiotensin activation to defend blood pressure.

Step 2: The renal response includes constriction of the afferent arteriole, that is an increase in afferent arteriolar resistance, which is the key active mechanism listed.

Step 3: This vasoconstriction reduces GFR, while aldosterone and ADH are released to retain salt and water and tissue fluid shifts into plasma to restore volume.

Step 4: Option A (decreased renal blood flow) is a passive consequence of hypotension rather than the kidney's active response, GFR does not stay unaltered, and perfusion falls rather than rises. So the best answer is increased afferent arteriole resistance.

Quick Tip: The kidney actively constricts a glomerular inflow vessel to defend pressure.

48.



Choose the best method of diagnosis for the clinical sign represented in the image.

- (A) Serum copper
- (B) Serum ceruloplasmin
- (C) Karyotyping
- (D) PCR

Correct Answer: (B) Serum ceruloplasmin

Solution:

Step 1: The image shows a Kayser-Fleischer ring, a golden-brown ring at the corneal periphery caused by copper deposition in Descemet's membrane. **Step 2:** This sign is characteristic of Wilson's disease, an autosomal recessive disorder of copper metabolism. **Step 3:** The best screening and diagnostic test among the options is serum ceruloplasmin, which is the copper-carrying ferroxidase and is characteristically low in Wilson's disease (part of Sternlieb's criteria along with KF rings, raised hepatic copper and increased 24-hour urinary copper). **Step 4:** Serum copper alone is unreliable because free copper rises while total copper may fall, and karyotyping or PCR are not used to diagnose this metabolic condition. Hence serum ceruloplasmin is correct.

Quick Tip: The corneal ring points to Wilson disease, so test the copper-carrying protein.

49. Which of the following is an epithelial tumour of the stomach?

- (A) Carcinoid
- (B) Lymphoma
- (C) GIST
- (D) Gastric adenocarcinoma

Correct Answer: (D) Gastric adenocarcinoma

Solution:

Step 1: An epithelial tumour arises from the glandular lining (mucosal epithelium) of the organ. **Step 2:** Gastric adenocarcinoma is a malignant epithelial tumour originating from the glandular epithelium of the gastric mucosa and aggressively invades the gastric wall. **Step 3:** By the Lauren classification it is divided into an intestinal type (irregular tubular glands) and a diffuse type (mucinous, signet-ring, linitis plastica or leather-bottle stomach). **Step 4:** Carcinoid is a neuroendocrine tumour, lymphoma is of lymphoid origin, and GIST

arises from the interstitial cells of Cajal (mesenchymal), so none of these are epithelial. The answer is gastric adenocarcinoma.

Quick Tip: Pick the tumour that arises from glandular mucosal epithelium, not nerve, lymphoid or mesenchymal cells.

50. Identify an X-linked disorder.

- (A) Colour blindness
- (B) Thalassemia
- (C) Azoospermia
- (D) Retinitis pigmentosa

Correct Answer: (A) Colour blindness

Solution:

Step 1: An X-linked disorder is caused by a gene defect carried on the X chromosome and therefore affects males more often. **Step 2:** Red-green colour blindness results from mutations in the red and green cone pigment genes located on the X chromosome, making it the classic X-linked recessive trait (blue pigment is coded on chromosome 7). **Step 3:** Hence it is more common in males than females and fits the definition exactly. **Step 4:** Thalassemia is autosomal recessive (genes on chromosomes 11 and 16), while azoospermia and retinitis pigmentosa in this context are linked to the Y chromosome, so colour blindness is the answer.

Quick Tip: Which condition is carried on the X chromosome and is far commoner in males?

51. H and L (lymphocytic and histiocytic) cells are seen in which type of Hodgkin lymphoma?

- (A) Mixed cellularity Hodgkin
- (B) Lymphocyte depleted
- (C) Lymphocyte predominance
- (D) Nodular sclerosis

Correct Answer: (C) Lymphocyte predominance

Solution:

Step 1: Hodgkin lymphoma is divided into classical Hodgkin lymphoma and nodular lymphocyte-predominant Hodgkin lymphoma (NLPHL). **Step 2:** Classical HL (which includes mixed cellularity, lymphocyte depleted and nodular sclerosis) shows the diagnostic Hodgkin and Reed-Sternberg (HRS) cells. **Step 3:** In contrast, the nodular lymphocyte-predominant subtype contains lymphocytic and histiocytic (L&H) cells, also called popcorn cells, rather than classic Reed-Sternberg cells. **Step 4:** Therefore the H and L cell variant corresponds to lymphocyte predominance Hodgkin lymphoma.

Quick Tip: Popcorn (L&H) cells instead of Reed-Sternberg cells point to which subtype?

52. Stellate granuloma is seen in:

- (A) Sarcoidosis
- (B) Cat scratch disease
- (C) Cryptococcosis
- (D) Histoplasmosis

Correct Answer: (B) Cat scratch disease

Solution:

Step 1: Cat scratch disease is a bacterial infection caused by *Bartonella henselae*, acquired from the scratch of an infected cat or kitten. **Step 2:** It produces a granulomatous lymphadenitis. The regional lymph nodes show follicular

hyperplasia with central stellate (star-shaped) areas of necrosis containing neutrophils, surrounded by palisading histiocytes (a suppurative granuloma).

Step 3: This stellate or stellate-shaped suppurative granuloma is the characteristic histological clue. **Step 4:** Sarcoidosis shows non-caseating epithelioid granulomas, while cryptococcosis and histoplasmosis are fungal granulomas without this stellate suppurative pattern, so cat scratch disease is correct.

Quick Tip: A star-shaped suppurative granuloma from a Bartonella infection.

53. Which option best explains the LDH flipped (flipping) pattern?

- (A) $\text{LDH } 1 > \text{LDH } 2$
- (B) $\text{LDH } 2 > \text{LDH } 1$
- (C) $\text{LDH } 2 > \text{LDH } 3$
- (D) $\text{LDH } 3 > \text{LDH } 2$

Correct Answer: (A) $\text{LDH } 1 > \text{LDH } 2$

Solution:

Step 1: Lactate dehydrogenase is a tetramer with H (heart) and M (muscle) subunits, giving five isoenzymes. LDH-1 (4H) predominates in the heart and red cells, while LDH-2 (3H1M) normally predominates in serum. **Step 2:** Normally the serum shows LDH-2 greater than LDH-1. **Step 3:** After myocardial infarction, damaged cardiac tissue releases large amounts of LDH-1 into the blood, so LDH-1 becomes greater than LDH-2. This reversal is called the flipped or flipping pattern. **Step 4:** Hence the flip is defined by LDH 1 greater than LDH 2, making option A correct; the other options do not describe this cardiac reversal.

Quick Tip: After an MI the heart isoenzyme overtakes the normally dominant serum one.

54. Nude mice are not resistant to xenografts because of the absence of which cells?

- (A) B cells
- (B) T cells
- (C) Both B and T cells
- (D) None

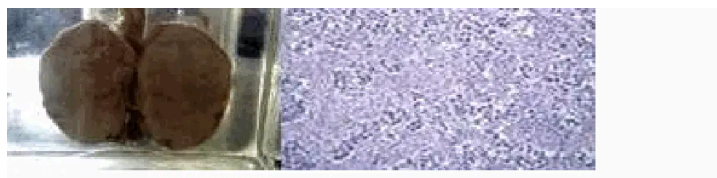
Correct Answer: (B) T cells

Solution:

Step 1: Nude mice carry a mutation that leaves them without a functional thymus, so they cannot generate mature T lymphocytes. **Step 2:** Without T cells they cannot mount adaptive responses that need CD4 helper and CD8 cytotoxic cells, including graft rejection. **Step 3:** Because graft rejection of both allografts and xenografts requires CD4+ and CD8+ T cells, the absence of T cells lets transplanted (xenograft) tumours grow without rejection. **Step 4:** B cells are largely present and the defect is not of both lineages, so the correct answer is absence of T cells.

Quick Tip: Athymic mice lack maturation of which lymphocyte needed for graft rejection?

55.



Identify the condition represented in the image.

- (A) Seminoma
- (B) Germ cell differentiated tumour
- (C) Non-seminoma
- (D) Teratoma

Correct Answer: (A) Seminoma

Solution:

Step 1: The image is of a seminoma, a germ cell tumour of the testis (rarely of the mediastinum or other extra-gonadal sites). **Step 2:** It is a malignant neoplasm that originates from the germinal epithelium of the seminiferous tubules but is one of the most treatable and curable cancers, with a survival rate above 95 percent in early stages. **Step 3:** The diagnostic histology shows sheets of uniform tumour cells with clear cytoplasm separated by fibrous septa that contain a prominent lymphocytic infiltrate. **Step 4:** This lymphocyte-rich septate pattern distinguishes it from non-seminomatous germ cell tumours and teratoma, so the answer is seminoma.

Quick Tip: A testicular germ cell tumour with clear cells in nests separated by lymphocyte-rich septa.

56. Anaplasia is:

- (A) Changing one type of epithelium to another
- (B) Nuclear chromatin
- (C) Lack of differentiation
- (D) Morphological changes

Correct Answer: (C) Lack of differentiation

Solution:

Step 1: Anaplasia refers to a lack of differentiation in neoplastic cells. **Step 2:** Well-differentiated tumours closely resemble their tissue of origin, whereas

anaplastic (poorly or undifferentiated) tumour cells appear primitive and lack specialisation along any cell line. **Step 3:** Anaplasia is a hallmark of malignancy and is associated with features such as pleomorphism, hyperchromatic nuclei and abnormal mitoses. **Step 4:** Changing one type of epithelium to another describes metaplasia, not anaplasia, while nuclear chromatin and vague morphological changes are not the definition, so lack of differentiation is correct.

Quick Tip: Tumour cells that look primitive and no longer resemble their parent tissue.

57. Which level of prolactin definitely suggests a prolactinoma?

- (A) 200 ng/ml
- (B) 150 ng/ml
- (C) 50 ng/ml
- (D) 100 ng/ml

Correct Answer: (A) 200 ng/ml

Solution:

Step 1: Prolactinomas are benign prolactin-secreting (lactotroph) adenomas of the pituitary gland that raise blood prolactin. **Step 2:** Mild elevations can result from many causes (drugs, hypothyroidism, stalk effect), but a persistently very high level is what definitely points to a prolactinoma. **Step 3:** A serum prolactin persistently above roughly 150 to 200 ng/ml is considered diagnostic of a prolactinoma, so among the options the highest value, 200 ng/ml, is the one that definitely confirms it. **Step 4:** Levels of 50 or 100 ng/ml can occur with non-tumour causes and do not definitively prove a prolactinoma, so 200 ng/ml is the answer.

Quick Tip: Only the highest value definitely confirms a prolactin-secreting tumour.

58. Laxative abuse causes which of the following renal stones?

- (A) Uric acid
- (B) Ammonium urate
- (C) Struvite
- (D) Calcium oxalate

Correct Answer: (B) Ammonium urate

Solution:

Step 1: Most kidney stones are calcium oxalate, with uric acid, struvite (infection stones) and cystine being less common. **Step 2:** Chronic laxative abuse causes ongoing potassium and fluid loss through the gut. **Step 3:** To compensate for the resulting hypokalaemia and acid-base shifts, the kidney increases ammonium production, which favours formation of the uncommon ammonium acid urate (ammonium urate) stone. **Step 4:** Therefore the stone specifically linked to laxative abuse is ammonium urate, not the more general calcium oxalate, uric acid or infection-related struvite stones.

Quick Tip: Potassium loss from laxatives raises renal ammonium, favouring an unusual urate stone.



59.



Identify the condition shown in the image.

- (A) Lobar pneumonia
- (B) Bronchopneumonia
- (C) Acute glomerulonephritis
- (D) Congested kidney

Correct Answer: (A) Lobar pneumonia

Solution:

Step 1: The image shows red hepatization of the lung, where the cut surface looks brown-red, firm and airless, resembling liver. **Step 2:** Red hepatization is a stage of lobar pneumonia, most commonly caused by *Streptococcus pneumoniae*. **Step 3:** Lobar pneumonia progresses through congestion, red hepatization (alveoli filled with red cells, neutrophils and fibrin), grey hepatization and resolution. **Step 4:** The diffuse consolidation of an entire lobe seen here is typical of lobar pneumonia rather than the patchy lesions of bronchopneumonia or any renal condition, so the answer is lobar pneumonia.

Quick Tip: A firm, airless, liver-like lung (red hepatization) points to which pneumonia pattern?

60.



Identify the condition represented in the image below.

- (A) Miliary tuberculosis
- (B) Bronchiectasis
- (C) COPD
- (D) Lung cancer

Correct Answer: (A) Miliary tuberculosis

Solution:

Step 1: The image shows miliary tuberculosis, the widespread haematogenous dissemination of *Mycobacterium tuberculosis*. **Step 2:** It produces a distinctive pattern of tiny 1 to 5 mm nodular lesions scattered evenly throughout both lung fields. **Step 3:** These innumerable small spots resemble millet seeds, which gives the disease its name miliary. The same seeding can also involve the liver and spleen. **Step 4:** This uniform fine micronodular spread differs from the dilated

airways of bronchiectasis, the hyperinflation of COPD, or a discrete mass of lung cancer, so the answer is miliary tuberculosis.

Quick Tip: Countless tiny millet-seed-like nodules across both lungs.



61. Which of the following can result in dactylitis?

- (A) Hemophilia
- (B) Von Willebrand disease type 1
- (C) Measles
- (D) Sickle cell anemia

Correct Answer: (D) Sickle cell anemia

Solution:

Step 1: Dactylitis (hand-foot syndrome) is painful swelling of the bones of the hands and feet. **Step 2:** It is a classic early manifestation of sickle cell anemia, often the first symptom seen in affected infants. **Step 3:** It results from vaso-occlusion by sickled red cells in the small bones, causing ischaemia and infarction of the metacarpals, metatarsals and phalanges. **Step 4:** Hemophilia and von Willebrand disease cause bleeding into joints (haemarthrosis) rather than dactylitis, and measles is a viral exanthem, so sickle cell anemia is the answer.

Quick Tip: Painful hand-foot swelling that is often the first sign of which haemoglobinopathy?



62. Which chromosome is responsible for the production of MIF (Mullerian inhibiting factor)?

- (A) Chromosome 16
- (B) Chromosome 22
- (C) X chromosome
- (D) Y chromosome

Correct Answer: (D) Y chromosome

Solution:

Step 1: Mullerian inhibiting factor (MIF), also called anti-Mullerian hormone (AMH), is secreted by the Sertoli cells of the testis and causes regression of the Mullerian ducts in the male fetus. **Step 2:** Testis development is initiated by the SRY gene, the testis-determining factor located on the short arm of the Y chromosome. **Step 3:** AMH/MIF is a downstream effect of the SRY pathway, so the chromosome ultimately responsible for its production in the male is the Y chromosome. **Step 4:** Although the structural AMH gene and its receptor are autosomal, the production of MIF in the developing testis is driven by the Y chromosome through SRY, so the answer is the Y chromosome.

Quick Tip: MIF follows testis formation, which is switched on by SRY on which chromosome?

63. Burkholderia cepacia is resistant to which of the following drugs?

- (A) Ceftazidime
- (B) Trimethoprim-sulfamethoxazole
- (C) Temocillin
- (D) Cefotetan

Correct Answer: (D) Cefotetan

Solution:

Step 1: Burkholderia cepacia complex organisms are intrinsically resistant to a broad range of antibiotics, including aminoglycosides, polymyxins, first and

second generation cephalosporins, and carboxypenicillins. **Step 2:** Cefotetan is a second generation (cephamycin) cephalosporin, so it falls within this intrinsic resistance and is not effective. **Step 3:** In contrast, agents that do work against B. cepacia complex include meropenem, ceftazidime, piperacillin, temocillin and trimethoprim-sulfamethoxazole. **Step 4:** Since the question asks for the drug it is resistant to, the answer is cefotetan, while the other three listed agents are active.

Quick Tip: It resists the early-generation cephalosporin, not ceftazidime, temocillin or co-trimoxazole.

64. Shingles is caused by which of the following?

- (A) Varicella-zoster
- (B) Herpes simplex
- (C) CMV
- (D) None

Correct Answer: (A) Varicella-zoster

Solution:

Step 1: Shingles is the lay term for herpes zoster, a painful, dermatome-restricted vesicular skin rash.

Step 2: It results from reactivation of latent varicella-zoster virus (VZV), the very same virus that produces chickenpox during the primary infection. After chickenpox resolves, VZV lies dormant in the dorsal root ganglia and can reactivate years later, travelling down a sensory nerve to produce the unilateral rash.

Step 3: Herpes simplex virus causes cold sores and genital herpes, CMV causes mononucleosis-like illness and disease in the immunocompromised, so options B, C and D are incorrect. The correct answer is varicella-zoster.

Quick Tip: Same virus that causes chickenpox, reactivated in a dermatome.

65. Urea breath test is used for diagnosis of:

- (A) *H. pylori*
- (B) *Campylobacter jejuni*
- (C) *E. coli*
- (D) *Lactobacillus*

Correct Answer: (A) *H. pylori*

Solution:

Step 1: The urea breath test is a rapid, non-invasive test used to detect *Helicobacter pylori*, the spiral gram-negative bacterium linked to gastritis, gastric ulcer and peptic ulcer disease.

Step 2: The principle relies on the potent urease enzyme of *H. pylori*. The patient swallows urea labelled with a carbon isotope. If *H. pylori* is present, its urease splits the urea into ammonia and carbon dioxide, and the labelled CO₂ is then detected in the exhaled breath.

Step 3: *Campylobacter jejuni*, *E. coli* and *Lactobacillus* are not diagnosed by this test, so the correct answer is *H. pylori*.

Quick Tip: Think of the urease-positive spiral bacterium of the stomach.

66. Hyperacute graft rejection occurs after how much time?

- (A) 24 hours
- (B) 2 weeks
- (C) In minutes
- (D) Years

Correct Answer: (C) In minutes

Solution:

Step 1: Hyperacute rejection is the fastest form of graft rejection, occurring within minutes of vascular anastomosis, often while the patient is still on the operating table.

Step 2: It is mediated by pre-formed recipient antibodies, classically against mismatched ABO blood group antigens on the donor endothelium. These antibodies bind immediately, activate complement and the clotting cascade, and cause thrombosis and ischaemic destruction of the graft.

Step 3: By contrast, acute rejection takes days to weeks and chronic rejection takes months to years. Therefore the correct timing for hyperacute rejection is in minutes.

Quick Tip: Pre-formed antibodies act the instant the graft is perfused.

67. Australian antigen for hepatitis B is?

- (A) HBsAg
- (B) HBeAg
- (C) HBdAg
- (D) HBV DNA

Correct Answer: (A) HBsAg

Solution:

Step 1: The Australia antigen was the historic name given to a serum protein first detected in an Australian aborigine and later shown to be linked to hepatitis B.

Step 2: This protein is HBsAg, the surface antigen of the hepatitis B virus. Its presence in serum indicates current hepatitis B infection, whether acute or chronic.

Step 3: HBeAg is a marker of high viral replication and infectivity, and HBV DNA quantifies viral load, but neither is the Australia antigen. Hence the correct answer is HBsAg.

Quick Tip: It is the surface coat protein detected first in HBV infection.

68. Which fungus is most commonly associated with orbital cellulitis in patients with diabetic ketoacidosis?

- (A) Candida
- (B) Mucor
- (C) Aspergillus
- (D) Rhizopus

Correct Answer: (B) Mucor

Solution:

Step 1: Orbital cellulitis is an infection behind the orbital septum that may cause proptosis, restricted eye movement with diplopia, severe pain, chemosis and tender periorbital swelling.

Step 2: In a diabetic, especially during ketoacidosis, the acidic and glucose-rich environment favours invasive mould infection. The classic agent of rhino-orbital-cerebral disease in this setting is Mucor, an angioinvasive zygomycete that causes vascular thrombosis and tissue infarction.

Step 3: Aspergillus can also cause invasive orbital disease in the immunosuppressed, but the strongest classic link in diabetic ketoacidosis is with Mucor (mucormycosis). Candida and Rhizopus are less typical answers for this exact association, so the best answer is Mucor.

Quick Tip: Angioinvasive mould of rhino-orbital-cerebral disease in ketoacidosis.

69. Sabin-Feldman dye test is used for diagnosis of which of the following conditions:

- (A) Botulism
- (B) Toxoplasmosis
- (C) Sarcoidosis
- (D) Yellow fever

Correct Answer: (B) Toxoplasmosis

Solution:

Step 1: The Sabin-Feldman dye test is a classic serologic test used to diagnose infection with *Toxoplasma gondii*.

Step 2: In the test, live *Toxoplasma* organisms are exposed to the patient serum. If specific antibodies are present, they damage the parasite membrane so that it no longer takes up methylene blue dye, and the organisms appear unstained. The absence of staining indicates a positive result.

Step 3: Botulism is diagnosed by toxin detection, sarcoidosis by histology and serum ACE, and yellow fever by serology or PCR. None of these uses the dye test, so the answer is toxoplasmosis.

Quick Tip: A dye-exclusion serology for an intracellular protozoan.

70. Acute haemorrhagic conjunctivitis is caused by which enterovirus type?

- (A) 69
- (B) 68
- (C) 70
- (D) 71

Correct Answer: (C) 70

Solution:

Step 1: Acute haemorrhagic conjunctivitis (AHC) is a highly contagious eye infection marked by conjunctival congestion, vascular dilatation, sub-conjunctival haemorrhage and lid oedema.

Step 2: Serologic studies show neutralising antibodies to Coxsackievirus A24 and to enterovirus 70 (EV70) as the causative agents. Enterovirus 70 is the classic answer for AHC.

Step 3: Enterovirus 71 is associated with hand-foot-mouth disease and neurological disease, enterovirus 68 with respiratory illness, so they are incorrect here. The answer is enterovirus 70.

Quick Tip: Same enterovirus number that pairs with Coxsackie A24 for red eye.

71. Echinococcus granulosus is commonly seen in which of the given animals:

- (A) Dog
- (B) Cat
- (C) Fox
- (D) Pig

Correct Answer: (A) Dog

Solution:

Step 1: Echinococcus granulosus, also called the hydatid worm or dog tapeworm, is a small cestode whose adult form lives in the small intestine of the definitive host.

Step 2: The domestic dog (Canis familiaris) is the recognised definitive host that harbours the adult worm and passes eggs in its faeces. Sheep and other herbivores act as intermediate hosts where hydatid cysts develop, and humans are accidental intermediate hosts.

Step 3: Cat, fox and pig are not the classic definitive host for this parasite, so the correct answer is dog.

Quick Tip: Its common name is the dog tapeworm.

72. An anaerobe causing multiple abscesses with discharging sinuses, demonstrating sulphur granules in pus, is?

- (A) Actinomycetes
- (B) Nocardia
- (C) Salmonella
- (D) Tularemia

Correct Answer: (A) Actinomycetes

Solution:

Step 1: The combination of multiple abscesses, chronic discharging sinuses and yellow sulphur granules in the pus is the classic picture of actinomycosis.

Step 2: Actinomyces species are anaerobic, gram-positive, filamentous branching bacteria. The sulphur granules are colonies of the organism within the pus, a hallmark feature of this infection.

Step 3: Nocardia is aerobic and partially acid-fast, Salmonella causes enteric fever and Tularemia (Francisella) causes ulceroglandular disease, none of which form sulphur granules. Therefore the answer is Actinomyces (actinomycetes).

Quick Tip: Anaerobic branching bacterium whose pus shows sulphur granules.

73. Whole blood is used as a sample for which test?

- (A) Bacteria
- (B) IGRA
- (C) GeneXpert
- (D) Virus

Correct Answer: (B) IGRA

Solution:

Step 1: Interferon-gamma release assays (IGRAs) are immunologic tests that aid in the diagnosis of Mycobacterium tuberculosis infection.

Step 2: IGRAs are performed on a whole-blood sample. The patient T cells in the blood are exposed to TB-specific antigens, and if the person has been infected, sensitised T cells release interferon-gamma, which is then measured.

Step 3: The other options are broad categories of organisms rather than a specific whole-blood assay; GeneXpert is typically run on sputum. Hence the test that specifically uses whole blood is IGRA.

Quick Tip: Whole-blood interferon-gamma assay for tuberculosis.

74. Which organism causes acute bacterial prostatitis?

- (A) Enterococcus
- (B) Streptococcus viridans
- (C) Peptostreptococcus
- (D) E. coli

Correct Answer: (D) E. coli

Solution:

Step 1: Acute bacterial prostatitis is most often caused by aerobic gram-negative bacilli that ascend the urethra or reflux into the prostatic ducts.

Step 2: Escherichia coli is by far the leading pathogen, responsible for about 50 to 80 percent of cases. Other Enterobacteriaceae such as Klebsiella and Proteus account for a smaller share, and Enterococcus for only a few percent.

Step 3: Streptococcus viridans and Peptostreptococcus are not typical prostatitis pathogens. Therefore the single most common cause among the choices is E. coli.

Quick Tip: Same gram-negative rod that tops the list for UTIs.

75. Which of the following organisms releases histamine and causes scombroid fish poisoning?

- (A) Salmonella
- (B) Staphylococcus
- (C) P. aeruginosa
- (D) Weissella

Correct Answer: (C) P. aeruginosa

Solution:

Step 1: Scombroid poisoning is a histamine-mediated illness from eating dark-meat fish such as tuna or mackerel that have not been refrigerated promptly after

catching.

Step 2: Bacterial enzymes (histidine decarboxylase) act on histidine in the fish flesh and convert it to histamine. The implicated organisms are mainly enteric gram-negative bacteria, including *Morganella morganii*, *Escherichia coli*, *Klebsiella* species and *Pseudomonas aeruginosa*, found in the fish skin and gut.

Step 3: Among the listed options, *Pseudomonas aeruginosa* is the recognised histamine-producing organism, so the correct answer is *P. aeruginosa*. *Salmonella*, *Staphylococcus* and *Weissella* are not the classic scombroid agents here.

Quick Tip: A gram-negative rod that decarboxylates histidine to histamine.

76. Who is the father of microbiology?

- (A) A. van Leeuwenhoek
- (B) Robert Brown
- (C) J. C. Bose
- (D) Pasteur

Correct Answer: (A) A. van Leeuwenhoek

Solution:

Step 1: The title father of microbiology is traditionally given to Antoni van Leeuwenhoek.

Step 2: Using his hand-crafted single-lens microscopes, he was the first to observe and describe living micro-organisms, which he called animalcules, including bacteria and protozoa.

Step 3: Robert Brown described the cell nucleus and Brownian motion, J. C. Bose worked on plant physiology and Pasteur is the father of modern microbiology

and germ theory rather than the discoverer of microbes. Thus the answer is Leeuwenhoek.

Quick Tip: First to see animalcules through a single-lens microscope.

77. Cutaneous larva migrans is caused by which organism?

- (A) Strongyloides
- (B) Toxocara canis
- (C) Ancylostoma braziliense
- (D) Necator americanus

Correct Answer: (C) Ancylostoma braziliense

Solution:

Step 1: Cutaneous larva migrans (CLM) is a creeping serpiginous skin eruption caused by larvae of animal hookworms that penetrate human skin but cannot complete their life cycle in us.

Step 2: The most common cause, particularly in the Americas, is Ancylostoma braziliense, the dog and cat hookworm. Its larvae wander through the epidermis, producing the itchy, migrating tracks colloquially called creeping eruption or ground itch.

Step 3: Ancylostoma duodenale and Necator americanus are human hookworms for which humans are definitive hosts, and Toxocara canis causes visceral larva migrans. Therefore the answer is Ancylostoma braziliense.

Quick Tip: Dog and cat hookworm whose larvae make creeping tracks in skin.

78. After kidney transplantation, infection with which organism is more likely to happen?

- (A) CMV
- (B) Klebsiella
- (C) Streptococcus
- (D) Staphylococcus

Correct Answer: (A) CMV

Solution:

Step 1: After solid organ transplantation, the patient is immunosuppressed, and opportunistic viral infections become common, especially in the first few months.

Step 2: Cytomegalovirus (CMV) is the single most common and important viral infection after kidney transplantation. The typical CMV syndrome presents with fever (most common feature), leukopenia, hepatosplenomegaly, myalgia and arthralgia.

Step 3: Bacterial organisms such as Klebsiella, Streptococcus and Staphylococcus cause infections too, but they are not the characteristic post-transplant pathogen highlighted in this setting. Hence the answer is CMV.

Quick Tip: Most common opportunistic virus after solid organ transplant.

79. Microbial cause of catheter infection in a young female.

- (A) S. aureus
- (B) S. viridans
- (C) P. mallei
- (D) P. cepacia

Correct Answer: (A) S. aureus

Solution:

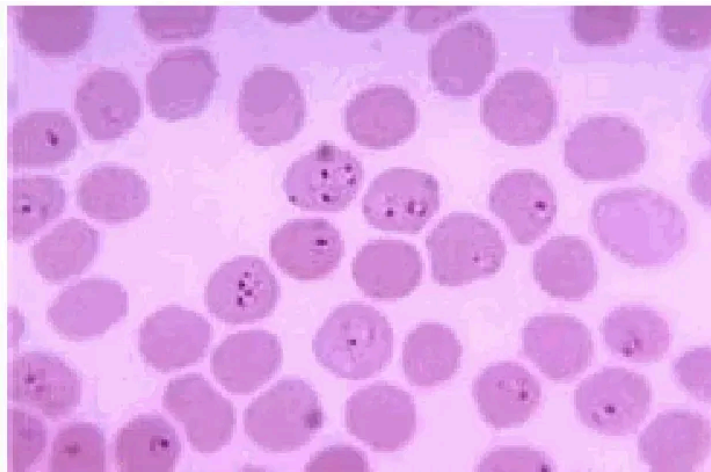
Step 1: Catheter-related bloodstream infections are dominated by skin commensal bacteria that colonise the catheter surface.

Step 2: By frequency the order is coagulase-negative staphylococci (30 to 40 percent), then *Staphylococcus aureus* (5 to 10 percent), enterococci, *Candida* and *Pseudomonas aeruginosa*. Coagulase-negative staphylococci are not in the option list, so among the choices given the next most common and the best answer is *Staphylococcus aureus*.

Step 3: *Streptococcus viridans*, *Pseudomonas mallei* and *Burkholderia cepacia* are far less common catheter pathogens, so the answer is *S. aureus*.

Quick Tip: Skin staphylococcus is the top catheter coloniser among the options.

80.



Identify the organism related to the blood smear image.

- (A) Plasmodium malariae
- (B) S. Typhi
- (C) Treponema pallidum
- (D) Toxoplasma gondii

Correct Answer: (A) Plasmodium malariae

Solution:

Step 1: The blood smear shows intra-erythrocytic ring-form trophozoites, which is the diagnostic appearance of malaria parasites inside red blood cells.

Step 2: Thick smears are used to detect the presence of parasites, while thin smears allow species identification. This thin smear shows multiple early ring-form trophozoites within red cells, consistent with a Plasmodium species (malaria parasite).

Step 3: Salmonella Typhi is diagnosed by blood culture, Treponema pallidum by dark-field or serology, and Toxoplasma typically by serology. The organism on this smear is the malaria parasite, so the answer is Plasmodium.

Quick Tip: Ring forms inside red cells mean the malaria parasite.

81. Which of the following is an endogenous pyrogen?

- (A) PGE2
- (B) PGD2
- (C) PGF2 alpha
- (D) PGI2

Correct Answer: (A) PGE2

Solution:

Step 1: Pyrogens are substances that cause fever. They are classified as exogenous (such as bacterial toxins) and endogenous (such as IL-1, TNF-alpha, IL-6 and interferons).

Step 2: These cytokines act on the hypothalamus, where they raise the level of prostaglandin E2 (PGE2). PGE2 then resets the thermoregulatory set point upward, producing fever. Among the prostaglandins, PGE2 is the final common mediator that elevates the set point.

Step 3: PGD2, PGF2 alpha and PGI2 are not the fever-producing prostaglandin at the hypothalamic set point, so the best answer here is PGE2.

Quick Tip: The prostaglandin that resets the hypothalamic set point in fever.

82. In Bartter syndrome, the defect is seen in:

- (A) Defect in PCT
- (B) Defect in DCT
- (C) Defect in thick ascending limb of loop of Henle
- (D) None

Correct Answer: (C) Defect in thick ascending limb of loop of Henle

Solution:

Step 1: Bartter syndrome is an autosomal recessive renal tubular disorder that mimics chronic loop diuretic use.

Step 2: The genetic defect lies in the thick ascending limb of the loop of Henle. Mutations affect the Na-K-2Cl cotransporter, the potassium channel (ROMK) or the chloride channel, impairing salt reabsorption and the kidney's concentrating ability.

Step 3: A proximal tubule (PCT) or distal convoluted tubule (DCT) defect would

describe other disorders; Gitelman syndrome, for example, affects the DCT. Therefore the answer for Bartter syndrome is the thick ascending limb of the loop of Henle.

Quick Tip: It behaves like a permanent loop diuretic; think where they act.

83. Not seen in allergic bronchopulmonary aspergillosis is:

- (A) High IgE level
- (B) Recurrent pneumonia
- (C) Occurrence in patients with old cavitory lesions
- (D) Pleural effusion

Correct Answer: (B) Recurrent pneumonia

Solution:

Step 1: Allergic bronchopulmonary aspergillosis (ABPA) is a pulmonary hypersensitivity disorder caused by allergy to *Aspergillus* antigens colonising the airways, typically in atopic asthmatics.

Step 2: Its diagnostic features include a history of asthma, transient or fixed pulmonary infiltrates, peripheral eosinophilia greater than 1000 per microlitre, immediate skin reactivity to *Aspergillus*, serum precipitins, markedly elevated serum IgE, and central or proximal bronchiectasis. It may occur in lungs with old cavitory lesions.

Step 3: Recurrent pneumonia is not a recognised feature of ABPA, so the option that is NOT seen is recurrent pneumonia.

Quick Tip: ABPA is allergy, not repeated infection; find the infection answer.

84. Pseudo P pulmonale is seen in:

- (A) Hypokalemia
- (B) Hyponatremia
- (C) Hypocalcemia
- (D) Hypercalcemia

Correct Answer: (A) Hypokalemia

Solution:

Step 1: On the ECG, a tall peaked P wave is called P pulmonale and indicates right atrial enlargement, often from tricuspid stenosis or pulmonary hypertension. A notched bifid P wave is P mitrale and indicates left atrial enlargement.

Step 2: A very similar tall, peaked P-wave appearance that mimics true P pulmonale, but without right atrial enlargement, is termed pseudo P pulmonale.

Step 3: This pseudo P pulmonale pattern is classically seen in hypokalemia. Hyponatremia, hypocalcemia and hypercalcemia do not produce this pattern, so the answer is hypokalemia.

Quick Tip: Tall peaked P waves mimicking P pulmonale from a low electrolyte.

85. An Automatic Implantable Cardioverter Defibrillator (AICD) implantation is done for which of the following conditions?

- (A) Brugada syndrome
- (B) Ventricular fibrillation
- (C) Acute coronary syndrome with low ejection fraction
- (D) All of the above

Correct Answer: (D) All of the above

Solution:

Step 1: An AICD is a small device implanted in the chest that continuously monitors heart rhythm and delivers a shock to terminate a dangerous arrhythmia. It is the most effective protection against sudden cardiac death.

Step 2: Brugada syndrome is a genetic ion-channel disorder that causes polymorphic ventricular tachycardia and a high risk of sudden death, so an AICD is indicated.

Step 3: Ventricular fibrillation is the prototypical lethal arrhythmia; survivors of VF arrest are classic candidates for an AICD as secondary prevention.

Step 4: Acute coronary syndrome leaving a low ejection fraction (typically EF $\leq 35\%$) carries a high risk of sudden arrhythmic death, so an AICD is used for primary prevention. Since every option is a valid indication, the answer is "All of the above."

Quick Tip: Both inherited channelopathies and post-MI low-EF patients qualify for a defibrillator.

86. What is the line of treatment for intractable Sydenham chorea?

- (A) Haloperidol
- (B) Valproate
- (C) Warfarin
- (D) Risperidone

Correct Answer: (B) Valproate

Solution:

Step 1: Sydenham chorea (also called chorea minor or rheumatic chorea) is the most common acquired chorea of childhood and a major Jones criterion for

rheumatic fever. It produces rapid, uncoordinated jerking movements of the face, hands and feet.

Step 2: When the chorea is intractable, drugs that boost inhibitory GABA tone are preferred. Valproate enhances GABA activity and is the standard first choice for resistant cases.

Step 3: Haloperidol and risperidone are dopamine blockers that can suppress chorea, but they carry extrapyramidal side effects and are not the preferred first-line agent for intractable disease. Warfarin is an anticoagulant with no role here.

Quick Tip: The preferred drug enhances GABA action rather than blocking dopamine.

87. All of the following are diagnostic criteria for Neurofibromatosis type 1 EXCEPT:

- (A) Brain tumor
- (B) Acoustic neuromas
- (C) Pseudoarthrosis
- (D) Cafe-au-lait spots

Correct Answer: (B) Acoustic neuromas

Solution:

Step 1: Diagnosis of Neurofibromatosis type 1 (NF1) requires at least 2 of 7 clinical criteria: six or more cafe-au-lait macules, axillary or inguinal freckling, two or more neurofibromas (or one plexiform), optic nerve glioma, two or more Lisch nodules, a bony lesion such as sphenoid dysplasia or pseudarthrosis, and a first-degree relative with NF1.

Step 2: Cafe-au-lait spots and pseudarthrosis (a long-bone abnormality) are both listed NF1 criteria, and optic glioma is the characteristic brain tumor of NF1.

Step 3: Bilateral acoustic neuromas (vestibular schwannomas) are the hallmark

of Neurofibromatosis type 2, NOT type 1. Therefore acoustic neuroma is the exception.

Quick Tip: Bilateral acoustic neuromas point to NF2, not NF1.



88. What is the most common site of a chronic gastric ulcer?

- (A) Pyloric antrum
- (B) Upper part of lesser curvature
- (C) Lower part of lesser curvature
- (D) Segment of large intestine

Correct Answer: (A) Pyloric antrum

Solution:

Step 1: Chronic gastric ulcers are strongly linked to *Helicobacter pylori*, which colonizes the antral mucosa and drives chronic inflammation (responsible for about 60% of gastric and 50 to 75% of duodenal ulcers).

Step 2: Because the antrum is the main site of *H. pylori* colonization and acid-related mucosal injury, the pyloric antrum (especially along the lesser curvature near the antrum) is the most common site of a chronic gastric ulcer.

Step 3: The large intestine is not a site of gastric ulceration, and the upper or lower lesser curvature alone is less commonly cited than the antrum, making the pyloric antrum the best answer.

Quick Tip: Think of where *H. pylori* colonizes the stomach.



89. The approximate time interval between HIV infection and the manifestation of AIDS is:

- (A) 7.5 years
- (B) 10 years
- (C) 12 years
- (D) 11 years

Correct Answer: (B) 10 years

Solution:

Step 1: After initial HIV infection there is a long clinical latency period during which the virus slowly depletes CD4 T-cells while the patient remains relatively asymptomatic.

Step 2: In an untreated person, the average incubation time from infection to the development of AIDS is about 10 years.

Step 3: The other intervals (7.5, 11 and 12 years) are not the standard quoted figure, so 10 years is the correct answer.

Quick Tip: Recall the classic decade-long latency of untreated HIV.

90. Heller's myotomy is done for:

- (A) Zenker's diverticulum
- (B) Achalasia cardia
- (C) Bunions
- (D) Knee arthroscopy

Correct Answer: (B) Achalasia cardia

Solution:

Step 1: Achalasia cardia is an esophageal motility disorder where the lower esophageal sphincter fails to relax and esophageal peristalsis is lost, causing progressive difficulty swallowing both solids and liquids.

Step 2: Heller's myotomy is a surgical procedure that cuts (weakens) the muscle at the gastroesophageal junction so the tight sphincter opens, giving long-term symptom relief.

Step 3: Zenker's diverticulum (a pharyngeal pouch), bunions (a forefoot deformity) and knee arthroscopy are unrelated to esophageal sphincter surgery, so achalasia cardia is correct.

Quick Tip: The operation divides the muscle at the gastroesophageal junction.

91. A patient shows a pattern of myocardial stunning that does not match the territory of a single coronary artery on the ECG. What is the most likely diagnosis?

- (A) Takotsubo cardiomyopathy
- (B) Restrictive cardiomyopathy
- (C) Brugada cardiomyopathy
- (D) Pericardial disease

Correct Answer: (A) Takotsubo cardiomyopathy

Solution:

Step 1: Myocardial stunning is reversible contractile dysfunction of a myocardial segment that persists for a time even after blood flow is restored. Usually it follows the distribution of a major coronary artery.

Step 2: Takotsubo (stress) cardiomyopathy is a temporary, sudden weakening or stunning of the heart muscle, typically producing apical ballooning that crosses several coronary territories and therefore does not correspond to a single vessel.

Step 3: Restrictive cardiomyopathy causes diastolic stiffness rather than reversible regional stunning, Brugada is a channelopathy with a characteristic

ECG pattern not stunning, and isolated pericardial disease does not cause segmental wall stunning. Hence Takotsubo cardiomyopathy fits best.

Quick Tip: Reversible apical stunning that crosses coronary territories suggests a stress-induced cause.



92. An alternative drug for cardiac arrest in place of epinephrine is:

- (A) Amiodarone infusion
- (B) Atropine
- (C) High dose vasopressin
- (D) Adenosine

Correct Answer: (C) High dose vasopressin

Solution:

Step 1: During cardiac arrest a vasopressor is needed to raise systemic vascular resistance and coronary perfusion pressure. Epinephrine is the standard agent.

Step 2: Vasopressin at high dose acts directly on vascular smooth-muscle V1 receptors to cause vasoconstriction, working independently of adrenergic receptors. A single 40 unit dose can replace the first or second dose of epinephrine in pulseless arrest.

Step 3: Amiodarone is an antiarrhythmic (not a vasopressor), atropine is used for bradysystole but is not the epinephrine substitute, and adenosine is for supraventricular tachycardia. Hence high dose vasopressin is the alternative.

Quick Tip: Look for a non-adrenergic vasopressor that constricts vessels via V1 receptors.



93. A patient presents with cutaneous vasculitis, glomerulonephritis and peripheral neuropathy. Which investigation should be performed next to help diagnose the condition?

- (A) ANCA
- (B) Rheumatoid factor
- (C) HBsAg
- (D) MIF

Correct Answer: (A) ANCA

Solution:

Step 1: The combination of small-vessel cutaneous vasculitis, glomerulonephritis and peripheral neuropathy is the classic multisystem picture of a small-vessel vasculitis.

Step 2: Anti-neutrophil cytoplasmic antibodies (ANCA) are IgG autoantibodies directed against antigens in the cytoplasm of neutrophils and monocytes, and they define the group of ANCA-associated vasculitides. Testing ANCA is the appropriate next investigation.

Step 3: Rheumatoid factor is non-specific, HBsAg screens for hepatitis B (a different driver of vasculitis), and MIF is not a routine diagnostic test for this presentation. ANCA is the best choice.

Quick Tip: Skin, kidney and nerve involvement together point to a small-vessel vasculitis marker.

94. Cryoglobulinemia is most commonly associated with which of the following?

- (A) Hepatitis C
- (B) Ovarian cancer
- (C) Diabetes
- (D) Leukemia

Correct Answer: (A) Hepatitis C

Solution:

Step 1: Cryoglobulins are immunoglobulins (often mixtures of IgM, IgG or IgA with complement proteins) that become insoluble and precipitate at reduced temperatures, and their presence in blood is called cryoglobulinemia.

Step 2: Mixed cryoglobulinemia is strongly linked to chronic infection, and the single most important association is Hepatitis C virus infection.

Step 3: Ovarian cancer, diabetes and leukemia are not the classic causes of cryoglobulinemia, so Hepatitis C is correct.

Quick Tip: A chronic viral hepatitis is the classic trigger.

95. Which of the following causes hypokalemic metabolic alkalosis WITH hypertension?

- (A) Liddle syndrome
- (B) Bartter syndrome
- (C) Gitelman syndrome
- (D) Renal tubular acidosis

Correct Answer: (A) Liddle syndrome

Solution:

Step 1: The question asks for hypokalemic metabolic alkalosis that is accompanied by hypertension. The presence of high blood pressure is the key

discriminator.

Step 2: Liddle syndrome is a rare inherited disorder with overactivity of the epithelial sodium channel (ENaC). The kidney retains excess sodium and water (causing hypertension) while wasting potassium and hydrogen ions (causing hypokalemic alkalosis).

Step 3: Bartter and Gitelman syndromes also cause hypokalemic metabolic alkalosis but with NORMAL or LOW blood pressure, and renal tubular acidosis causes acidosis not alkalosis. Hence Liddle syndrome is the answer.

Quick Tip: An overactive ENaC channel retains sodium and raises blood pressure.

96. According to the GOLD criteria, very severe COPD is defined by:

- (A) $FEV_1/FVC < 70$ and $FEV_1 < 30$
- (B) $FEV_1/FVC < 70$ and $FEV_1 < 70$
- (C) $FEV_1/FVC < 70$ and $FEV_1 < 50$
- (D) Both A and C

Correct Answer: (A) $FEV_1/FVC < 70$ and $FEV_1 < 30$

Solution:

Step 1: The diagnosis of COPD requires a post-bronchodilator $FEV_1/FVC < 0.70$, which confirms persistent airflow limitation.

Step 2: GOLD staging then uses the FEV₁ percent predicted. Stage IV (very severe) is defined as $FEV_1/FVC < 70\%$ with $FEV_1 < 30\%$ predicted, or FEV₁ < 50% predicted plus chronic respiratory failure.

Step 3: The cleanest spirometric definition of very severe COPD among the options is $FEV_1/FVC < 70$ and $FEV_1 < 30$, so option A is correct.

Quick Tip: Very severe means FEV1 below 30 percent predicted with an obstructive ratio.



97. The Ankle-Brachial Pressure Index (ABPI) is artificially increased in:

- (A) Arteriosclerosis with calcified arteries
- (B) Ischemic ulcers
- (C) Intermittent claudication
- (D) Deep vein thrombosis

Correct Answer: (A) Arteriosclerosis with calcified arteries

Solution:

Step 1: The ABPI is the ratio of ankle systolic blood pressure to brachial (arm) systolic blood pressure. A low ratio suggests blocked arteries from peripheral artery disease.

Step 2: When the leg arteries are heavily calcified (medial calcific sclerosis, common in diabetes and chronic kidney disease), they become incompressible by the cuff. This falsely raises the recorded ankle pressure, giving an artificially high ABPI.

Step 3: Ischemic ulcers and intermittent claudication actually LOWER the ABPI, and DVT is a venous problem that does not raise it. Hence calcified arteriosclerotic arteries artificially elevate the ABPI.

Quick Tip: Incompressible calcified arteries give a falsely high ankle pressure.



98. Minimal brain dysfunction syndrome is seen in:

- (A) Dyslexia
- (B) ADHD
- (C) Mental subnormality
- (D) Down's syndrome

Correct Answer: (A) Dyslexia

Solution:

Step 1: Minimal brain dysfunction is a neurodevelopmental disorder marked by immaturity in the control of activity, emotions and behaviour, with specific learning disabilities in reading, writing and mathematics.

Step 2: A core clinical feature of minimal brain dysfunction is dyslexia, a specific reading disability reflecting impaired blending of auditory and visual functions in language.

Step 3: ADHD overlaps clinically but the classic associated learning disability described under this term is dyslexia, while mental subnormality and Down's syndrome are global intellectual conditions, not the specific learning-disability picture. Hence dyslexia is the answer.

Quick Tip: The associated specific learning disability is a reading disorder.

99. The site of action of amphotericin B is:

- (A) Ribosomes
- (B) Cell wall
- (C) Plasma membrane
- (D) Protein

Correct Answer: (C) Plasma membrane

Solution:

Step 1: Amphotericin B is a polyene antifungal obtained from *Streptomyces nodosus*. Polyenes act by targeting a sterol in the fungal membrane, not the cell wall.

Step 2: The drug has a high affinity for ergosterol, the sterol present in the fungal plasma (cell) membrane. It binds and inserts into the membrane.

Step 3: This insertion forms transmembrane pores (micropores) that markedly increase membrane permeability, leading to leakage of ions and fungal cell death. Therefore the site of action is the plasma membrane. (Note: fungi have a cell wall made of chitin or glucan, but amphotericin B does not act there - that is why "cell wall" is incorrect.)

Quick Tip: Polyenes bind ergosterol and punch pores in the fungal membrane.

100. Which antiretroviral drug also has anti-hepatitis activity?

- (A) Abacavir
- (B) Tenofovir
- (C) Nevirapine
- (D) Emtricitabine

Correct Answer: (D) Emtricitabine

Solution:

Step 1: The question asks for an antiretroviral that also works against hepatitis. Emtricitabine is a nucleoside reverse transcriptase inhibitor (NRTI) used for prevention and treatment of HIV in adults and children.

Step 2: Emtricitabine has dual activity, possessing both antiretroviral and anti-hepatitis B properties, and it is often combined with tenofovir.

Step 3: As the source explanation specifies emtricitabine, it is selected here. (In

practice tenofovir is also strongly active against hepatitis B, but per the recall key emtricitabine is the intended answer.)

Quick Tip: An NRTI partnered with tenofovir that also covers hepatitis B.

101. The drug of choice for resistant rheumatic chorea is:

- (A) Valproate
- (B) Haloperidol
- (C) Diazepam
- (D) Probenecid

Correct Answer: (A) Valproate

Solution:

Step 1: Rheumatic chorea (Sydenham chorea) follows an abnormal immune response to group A streptococcal infection and produces rapid, uncoordinated jerking movements of the face, hands and feet.

Step 2: The chorea responds poorly to antirheumatic drugs, so symptomatic treatment is used. Anticonvulsants such as valproate and carbamazepine, plus neuroleptics such as haloperidol and pimozide, are the mainstays.

Step 3: Among the options, valproate is the preferred drug of choice for resistant rheumatic chorea. Probenecid is a uricosuric for gout and has no role, making valproate correct.

Quick Tip: An anticonvulsant that boosts GABA is the preferred symptomatic agent.

102. At $pK_a = pH$, which of the following is true for a drug?

- (A) Concentration of drug is 50% ionic and 50% non-ionic
- (B) Absorption of drug is 50% ionic and 50% ionic
- (C) Concentration of drug is 75% ionic and 25% non-ionic
- (D) Concentration of drug is 25% ionic and 75% non-ionic

Correct Answer: (A) Concentration of drug is 50% ionic and 50% non-ionic

Solution:

Step 1: The Henderson-Hasselbalch equation links pH, pKa and the ratio of ionized to unionized drug. For a weak acid: $\text{pH} = \text{pKa} + \log \frac{[\text{ionized}]}{[\text{unionized}]}$.

Step 2: When pH equals pKa, the equation gives $\log \frac{[\text{ionized}]}{[\text{unionized}]} = 0$, which means the ratio is 1, since $\log 1 = 0$.

Step 3: A ratio of 1 means the ionized and unionized forms are present in equal amounts, that is 50% ionic and 50% non-ionic. Hence option A is correct.

Quick Tip: When pH equals pKa, the log of the ratio is zero, so the split is even.

103. The physiological dose of hydrocortisone (mg/kg/day) is:

- (A) 5 mg/kg/day
- (B) 10 mg/kg/day
- (C) 15 mg/kg/day
- (D) 20 mg/kg/day

Correct Answer: (B) 10 mg/kg/day

Solution:

Step 1: The body secretes two principal corticosteroids from the adrenal cortex: the glucocorticoid hydrocortisone (cortisol) and the mineralocorticoid aldosterone.

Step 2: The normal physiological rate of hydrocortisone secretion is about 10 mg per day (with nearly half released in the morning hours), while aldosterone is secreted at roughly 0.125 mg per day.

Step 3: Matching the options, the physiological dose of hydrocortisone corresponds to 10 mg/kg/day as quoted, so option B is correct.

Quick Tip: Recall the normal daily cortisol secretion, mostly released in the morning.

104. What is the mechanism of action of colchicine in acute gout?

- (A) Inhibition of purine metabolism
- (B) Inhibition of uric acid conversion
- (C) Migration of leukocytes
- (D) Leukocyte and lymphocyte migration inhibition and microtubular inhibition

Correct Answer: (D) Leukocyte and lymphocyte migration inhibition and microtubular inhibition

Solution:

Step 1: An acute gout attack begins when urate crystals precipitate in the synovial fluid, triggering an inflammatory response. Granulocytes migrate into the joint, phagocytose the crystals, and release glycoprotein and lysosomal enzymes that worsen joint damage.

Step 2: Colchicine, an alkaloid from *Colchicum autumnale*, binds to the fibrillar protein tubulin and inhibits microtubule assembly. This blocks the migration of granulocytes (leukocytes) into the inflamed joint and inhibits the release of glycoprotein.

Step 3: Importantly, colchicine does NOT inhibit uric acid synthesis or promote its excretion, so options A and B are wrong. The complete mechanism is

inhibition of leukocyte and lymphocyte migration together with microtubule inhibition, making option D the best answer (option C is incomplete).

Quick Tip: It binds tubulin and stops white cells from migrating, without altering uric acid.

105. Basiliximab is an:

- (A) IL-1 receptor antagonist
- (B) Anti-CD3 antibody
- (C) IL-2 receptor antagonist
- (D) TNF inhibitor

Correct Answer: (C) IL-2 receptor antagonist

Solution:

Step 1: Basiliximab is a monoclonal antibody directed against CD25, the alpha chain of the interleukin-2 (IL-2) receptor on activated T-lymphocytes.

Step 2: By binding CD25 with high affinity, it blocks IL-2 from engaging its receptor, thereby preventing IL-2 driven T-cell proliferation. This makes it an IL-2 receptor antagonist.

Step 3: It is used to prevent acute transplant rejection, has a short plasma half-life of about a week, and can cause anaphylaxis and opportunistic infections. It is not an IL-1 antagonist, anti-CD3 antibody or TNF inhibitor, so option C is correct.

Quick Tip: It targets CD25, the alpha chain of the IL-2 receptor.

106. Pirenzepine is used in the treatment of:

- (A) Gastric ulcer
- (B) Glaucoma
- (C) Hypertension
- (D) Congestive cardiac failure

Correct Answer: (A) Gastric ulcer

Solution:

Step 1: Identify the drug class. Pirenzepine is a selective M_1 muscarinic receptor antagonist (anticholinergic).

Step 2: Understand its action. By selectively blocking M_1 receptors on the enterochromaffin-like and parietal cell pathways, it reduces gastric acid secretion. It works at a low therapeutic dose range.

Step 3: Apply to the options. Reduced acid secretion makes it useful for peptic and gastric ulcer disease, so option A is correct.

Step 4: Exclude distractors. It is not used for glaucoma (those need pilocarpine or beta blockers), hypertension, or congestive cardiac failure, none of which involve M_1 acid-secretion blockade.

Quick Tip: Think of the selective M_1 anticholinergic that cuts gastric acid secretion.

107. Which of the following antipsychotics is most associated with increased prolactin secretion?

- (A) Olanzapine
- (B) Ziprasidone
- (C) Clozapine
- (D) Risperidone

Correct Answer: (D) Risperidone

Solution:

Step 1: Recall the prolactin link. Dopamine D_2 blockade in the tuberoinfundibular pathway removes dopamine's inhibition of prolactin, so prolactin rises.

Step 2: Compare the drugs. Risperidone is a potent D_2 blocker (more potent than clozapine) with combined 5-HT_{2a} and D_2 antagonism, and it causes a marked, dose-related rise in prolactin.

Step 3: Conclude. Among the choices, risperidone produces the greatest hyperprolactinemia, so option D is correct.

Step 4: Exclude distractors. Olanzapine, ziprasidone, and especially clozapine are relatively prolactin-sparing atypicals, so they are wrong.

Quick Tip: The most potent D₂ blocker among the atypicals raises prolactin the most.

108. Which of the following is a glucocorticoid synthesis inhibitor?

- (A) Mifepristone
- (B) Flutamide
- (C) Finasteride
- (D) Metyrapone

Correct Answer: (D) Metyrapone

Solution:

Step 1: Define the target. A glucocorticoid synthesis inhibitor blocks an enzyme in the cortisol biosynthetic pathway in the adrenal cortex.

Step 2: Identify the drug. Metyrapone inhibits 11 β -hydroxylase (CYP11B1), the enzyme that converts 11-deoxycortisol to cortisol (hydrocortisone), thereby

reducing cortisol production.

Step 3: Conclude. Metyrapone is the synthesis inhibitor, so option D is correct, and it is also used in the metyrapone test of HPA axis function.

Step 4: Exclude distractors. Mifepristone is a glucocorticoid and progesterone receptor antagonist (not a synthesis blocker), flutamide is an antiandrogen, and finasteride is a 5α -reductase inhibitor.

Quick Tip: Which agent blocks 11-beta-hydroxylase in the adrenal cortex?

109. Which of the following statements is incorrect with respect to prasugrel?

- (A) Not a prodrug
- (B) P2Y purinergic receptor blocker
- (C) Has strong antiplatelet activity
- (D) Causes intracranial hemorrhage in TIA patients

Correct Answer: (A) Not a prodrug

Solution:

Step 1: Note the question asks for the INCORRECT statement.

Step 2: Recall the pharmacology. Prasugrel is a thienopyridine that, like clopidogrel, is a prodrug requiring hepatic activation. It is then an irreversible antagonist of the platelet $P2Y_{12}$ ADP receptor.

Step 3: Evaluate the statements. It is rapidly and completely activated, giving strong and consistent antiplatelet activity (C correct), it blocks the P2Y receptor (B correct), and it raises bleeding risk including intracranial hemorrhage, so it is contraindicated after stroke or TIA (D correct).

Step 4: Conclude. Saying it is "not a prodrug" is false because prasugrel IS a prodrug, so option A is the incorrect statement and the answer.

Quick Tip: Prasugrel, like clopidogrel, needs hepatic activation - so one option is plainly false.



110. Q-T prolongation is most characteristically seen with which drug?

- (A) Quinidine
- (B) Amiodarone
- (C) Magnesium sulfate
- (D) Lignocaine

Correct Answer: (A) Quinidine

Solution:

Step 1: Recall the concept. Class IA antiarrhythmics block potassium channels, prolonging repolarization and the QT interval, which can trigger Torsades de Pointes.

Step 2: Identify the drug. Quinidine is the classic class IA agent and the most common cause of drug-induced QT prolongation and Torsades among the options.

Step 3: Conclude. Option A (quinidine) is correct.

Step 4: Exclude distractors. Lignocaine (class IB) shortens or does not prolong QT, magnesium sulfate is actually used to TREAT Torsades, and although amiodarone prolongs QT it rarely causes Torsades and is not the best single answer here.

Quick Tip: Which class IA antiarrhythmic is the classic cause of Torsades de Pointes?

111. Sacubitril is a:

- (A) ACE inhibitor
- (B) Neutral endopeptidase inhibitor
- (C) Calcium channel inhibitor
- (D) Beta adrenergic blocker

Correct Answer: (B) Neutral endopeptidase inhibitor

Solution:

Step 1: Identify the drug. Sacubitril is a prodrug whose active metabolite inhibits neprilysin, also called neutral endopeptidase.

Step 2: Understand the action. Inhibiting neprilysin prevents breakdown of natriuretic peptides, enhancing vasodilation and natriuresis.

Step 3: Conclude. Sacubitril is a neutral endopeptidase (neprilysin) inhibitor, so option B is correct. It is combined with valsartan in a 1:1 ratio (an ARNI) for heart failure.

Step 4: Exclude distractors. It is not an ACE inhibitor, calcium channel blocker, or beta blocker; those act by entirely different mechanisms.

Quick Tip: It is the neprilysin-blocking half of the valsartan combination used in heart failure.

112. Niacin therapy is relatively contraindicated in diabetes because it:

- (A) Increases the blood sugar levels
- (B) Causes scleroderma
- (C) Is difficult to give by injection
- (D) Increases the metabolism of oral hypoglycemic drugs

Correct Answer: (A) Increases the blood sugar levels

Solution:

Step 1: Recall niacin's metabolic effect. Niacin (nicotinic acid) is a lipid-lowering agent but it impairs glucose tolerance and causes insulin resistance.

Step 2: Link to diabetes. In diabetic patients this worsens glycemic control by raising blood glucose, making it a relative contraindication.

Step 3: Conclude. The reason is that niacin increases blood sugar levels, so option A is correct.

Step 4: Exclude distractors. It does not cause scleroderma, it is given orally, and its concern is hyperglycemia rather than altering hypoglycemic-drug metabolism.

Quick Tip: Niacin worsens glucose tolerance and insulin resistance.

113. Endothelin acts through which second messenger / receptor pathway?

- (A) cAMP
- (B) cGMP
- (C) Na⁺ receptors
- (D) Calcium receptors

Correct Answer: (B) cGMP

Solution:

Step 1: Recall endothelin biology. Endothelin-1 (ET-1) is a potent endogenous vasoconstrictor secreted by endothelial cells, acting on *ET_A* and *ET_B* receptors.

Step 2: Trace the messenger. Stimulation of endothelial *ET_B* receptors releases nitric oxide, which raises cyclic GMP (cGMP) in vascular smooth muscle and modulates the vascular response.

Step 3: Match the option text. The intended answer in the key is cGMP, which corresponds to option B.

Step 4: Exclude distractors. cAMP, sodium receptors, and calcium receptors are not the signaling route highlighted for endothelin in this item.

Quick Tip: Endothelin acting on endothelial receptors releases NO, which raises this cyclic nucleotide.

114. Which is the centrally acting alpha-2 agonist muscle relaxant?

- (A) Diazepam
- (B) Bromocriptine
- (C) Tizanidine
- (D) Methocarbamol

Correct Answer: (C) Tizanidine

Solution:

Step 1: Define the target. The question asks for a centrally acting muscle relaxant that works as an alpha-2 adrenergic agonist.

Step 2: Identify the drug. Tizanidine is a central alpha-2 agonist that inhibits release of excitatory amino acids from spinal interneurons and facilitates the inhibitory transmitter glycine.

Step 3: Effect and use. It reduces muscle tone and the frequency of spasms without much loss of muscle strength, and is used for spasticity and painful spinal muscle spasm.

Step 4: Exclude distractors. Diazepam acts via GABA-A, bromocriptine is a

dopamine agonist, and methocarbamol is a centrally acting relaxant but not an alpha-2 agonist. So option C is correct.

Quick Tip: Which clonidine-like central alpha-2 agonist is used to relieve spasticity?

115. Apixaban is a:

- (A) Antithrombin inhibitor
- (B) Direct factor Xa inhibitor
- (C) Platelet activator
- (D) Clotting factor XII

Correct Answer: (B) Direct factor Xa inhibitor

Solution:

Step 1: Recall the drug class. Apixaban is a direct oral anticoagulant (DOAC).

Step 2: Identify the target. It directly and selectively inhibits activated factor Xa, blocking conversion of prothrombin to thrombin.

Step 3: Clinical use. It is used for treatment and prophylaxis of venous thromboembolism, including DVT and pulmonary embolism, and for stroke prevention in atrial fibrillation.

Step 4: Conclude and exclude. Option B (direct factor Xa inhibitor) is correct. It is not an antithrombin agent, a platelet activator, or a clotting factor.

Quick Tip: The drug name ending in -xaban points to its target enzyme.

116. Anaerobes are intrinsically resistant to which class of antibiotics?

- (A) Beta lactam antibiotics
- (B) Aminoglycosides
- (C) Azithromycin
- (D) Metronidazole

Correct Answer: (B) Aminoglycosides

Solution:

Step 1: Recall how aminoglycosides enter bacteria. Their uptake across the membrane requires oxygen-dependent active transport.

Step 2: Apply to anaerobes. Anaerobic bacteria lack the oxidative metabolism needed to drive this uptake, so the drug cannot get in and they are intrinsically resistant.

Step 3: Define intrinsic resistance. It is the innate, inherent structural or functional ability of an organism to tolerate a drug class, reducing susceptibility from the outset.

Step 4: Exclude distractors. Metronidazole is in fact the drug of choice against anaerobes, and beta lactams and azithromycin have variable but not uniform intrinsic resistance. So option B is correct.

Quick Tip: Which antibiotic needs oxygen-dependent uptake that anaerobes cannot provide?

117. Which of the following is NOT a bacteriostatic antibiotic?

- (A) Clindamycin
- (B) Vancomycin
- (C) Tetracycline
- (D) Cephalosporins

Correct Answer: (B) Vancomycin

Solution:

Step 1: Note the negative stem; pick the bactericidal agent.

Step 2: Classify the options. Bacteriostatic drugs limit growth by interfering with protein synthesis or metabolism, and include tetracyclines and clindamycin.

Step 3: Identify the odd one. Vancomycin inhibits cell wall synthesis and is bactericidal, killing the organism rather than just halting growth.

Step 4: Conclude. Vancomycin is not bacteriostatic, so option B is the answer. Cephalosporins are also cell-wall-active and bactericidal, but among these choices vancomycin is the intended answer.

Quick Tip: Which cell-wall-active agent kills rather than just inhibits growth?

118. Which of the following causes melanosis coli?

- (A) Senna
- (B) Sorbitol
- (C) Magnesium sulphate
- (D) Bisacodyl

Correct Answer: (A) Senna

Solution:

Step 1: Define melanosis coli. It is a brownish-black pigmentation of the colonic mucosa from lipofuscin in macrophages, classically linked to chronic laxative use.

Step 2: Identify the cause. Anthranoid (anthraquinone) stimulant laxatives such as senna, aloe, and cascara sagrada produce this change.

Step 3: Conclude. Senna is the anthranoid laxative among the options, so option A is correct.

Step 4: Exclude distractors. Sorbitol and magnesium sulphate are osmotic laxatives, and bisacodyl is a stimulant but not an anthranoid, so they do not classically cause melanosis coli.

Quick Tip: Think anthranoid (anthraquinone) stimulant laxative.



119. Which is the antibiotic of choice for a bedridden patient with catheter-related UTI and pneumonia?

- (A) Amoxicillin
- (B) Beta lactam antibiotic with a beta lactamase inhibitor
- (C) 3rd generation cephalosporins
- (D) 2nd generation cephalosporins

Correct Answer: (B) Beta lactam antibiotic with a beta lactamase inhibitor

Solution:

Step 1: Assess the scenario. A bedridden patient with catheter-related UTI plus pneumonia is at risk of resistant, often beta-lactamase-producing organisms.

Step 2: Choose for that resistance. A beta lactam combined with a beta lactamase inhibitor (for example piperacillin-tazobactam or amoxicillin-clavulanate) overcomes beta-lactamase and provides broad coverage of these organisms.

Step 3: Conclude. Option B is the best choice because it pairs potent beta lactam activity with protection against beta-lactamase.

Step 4: Exclude distractors. Plain amoxicillin is destroyed by beta-lactamase, and

the cephalosporin options give narrower or less reliable coverage for this mixed, resistance-prone infection.

Quick Tip: Resistant organisms make beta-lactamase, so you need an inhibitor combination.

120. Mycoplasma is intrinsically resistant to which antibiotic?

- (A) Ceftriaxone
- (B) Cephalosporins
- (C) Aminoglycosides
- (D) Fluoroquinolones

Correct Answer: (A) Ceftriaxone

Solution:

Step 1: Recall mycoplasma structure. Mycoplasmas lack a cell wall.

Step 2: Link to drug action. Beta lactams such as ceftriaxone (a third generation cephalosporin) act by inhibiting cell wall synthesis, so with no cell wall to target they are ineffective and mycoplasma is intrinsically resistant.

Step 3: Conclude. Ceftriaxone is the cell-wall-active beta lactam in the options, so option A is correct.

Step 4: Note effective drugs. Macrolides, tetracyclines, and fluoroquinolones, which target protein or DNA, are the first-line treatments for Mycoplasma pneumoniae.

Quick Tip: No cell wall means cell-wall-active beta lactams cannot work.

121. Tadalafil should not be given together with:

- (A) Vasodilators
- (B) Antibiotics
- (C) Vasoconstrictors
- (D) Valproate

Correct Answer: (A) Vasodilators

Solution:

Step 1: Recall the drug. Tadalafil is a PDE-5 inhibitor that relaxes vascular smooth muscle and increases blood flow, used for erectile dysfunction and benign prostatic hyperplasia.

Step 2: Identify the dangerous interaction. Combining it with vasodilators, especially nitrates, causes additive vasodilation and a sudden, serious fall in blood pressure.

Step 3: Conclude. Tadalafil must not be co-administered with vasodilators, so option A is correct.

Step 4: Exclude distractors. Antibiotics, vasoconstrictors, and valproate do not carry this same critical hypotensive interaction.

Quick Tip: Adding another vasodilator (like nitrates) to a PDE-5 inhibitor crashes blood pressure.

122. Estimate the volume of Ringer lactate to be given in the first 8 hours for a 50 kg male with 40% second-degree burns.

- (A) 8 litres
- (B) 4 litres
- (C) 2 litres
- (D) 6 litres

Correct Answer: (B) 4 litres

Solution:

Step 1: Use the Parkland formula with lactated Ringer's solution: total 24-hour fluid = $4 \times \text{weight (kg)} \times \%TBSA$.

Step 2: Substitute the values:

$$4 \times 50 \times 40 = 8000 \text{ mL} = 8 \text{ litres over 24 hours.}$$

Step 3: Apply the timing rule. Half the total is given in the first 8 hours:

$$\frac{1}{2} \times 8000 = 4000 \text{ mL} = 4 \text{ litres.}$$

Step 4: Conclude. The first 8-hour volume is 4 litres, so option B is correct. The remaining 4 litres is given over the next 16 hours, titrated to a urine output of about 50 mL/hr.

Quick Tip: Parkland: $4 \times \text{kg} \times \%TBSA$, then give half in the first 8 hours.

123. A posthumous child is one who is:

- (A) Delivered after the death of the biological mother
- (B) Delivered after the death of the biological father
- (C) Born after the death of both parents
- (D) Abandoned by the parents

Correct Answer: (B) Delivered after the death of the biological father

Solution:

Step 1: Define the term. In forensic and legal usage, a posthumous child is a child born after the death of its biological father.

Step 2: Apply the definition. The child is conceived before the father's death but delivered afterward.

Step 3: Conclude. Option B matches this definition exactly.

Step 4: Exclude distractors. Birth after the mother's death, after both parents' death, or an abandoned child do not fit the standard definition of posthumous.

Quick Tip: It refers to birth after the father has died.

124. The M'Naghten rule comes under which section of the IPC?

- (A) CrPC 84
- (B) CrPC 48
- (C) IPC 84
- (D) IPC 48

Correct Answer: (C) IPC 84

Solution:

Step 1: Recall the rule. The M'Naghten rule, also called the right or wrong test, is the legal test of criminal responsibility in the insane.

Step 2: State its meaning. An accused is not legally responsible if, at the time of the act, a defect of reason from disease of the mind left them unable to know the nature of the act or that it was wrong.

Step 3: Locate it in law. In India this is embodied in Section 84 of the Indian Penal Code (IPC).

Step 4: Conclude and exclude. Option C (IPC 84) is correct; the CrPC options and IPC 48 do not house this rule.

Quick Tip: The insanity defense in India is codified under IPC Section 84.

125. Bluish discoloration of the gastric mucosa is seen in poisoning with which substance?

- (A) Mercury
- (B) Cadmium
- (C) Amytal sodium (amobarbital)
- (D) Arsenic

Correct Answer: (C) Amytal sodium (amobarbital)

Solution:

Step 1: Recall the color clues of corrosive and capsule poisons at autopsy. The gastric mucosa color often points to the agent.

Step 2: Match blue. A blue discoloration is classically seen with copper sulfate and with the dye in amytal (amobarbital) capsules.

Step 3: Conclude. Among the options, amytal sodium produces the bluish staining, so option C is correct.

Step 4: Exclude distractors. Mercury gives a slate-grey color, arsenic leaves white particles, and these do not produce the blue mucosa, so they are wrong.

Quick Tip: Recall the autopsy color chart: blue mucosa points to copper sulfate or amytal capsules.

126. Muscle pain along with nephropathy is caused by which metal poisoning?

- (A) Arsenic
- (B) Cadmium
- (C) Mercury
- (D) Lead

Correct Answer: (A) Arsenic

Solution:

Step 1: Note the combination asked: muscle pain plus nephropathy.

Step 2: Recall heavy-metal effects. Nephropathy (kidney injury) is common to many heavy metals, so it does not distinguish the answer by itself.

Step 3: Use the distinguishing feature. Myalgia (muscle pain) is the feature linked to arsenic poisoning, which combined with renal involvement points to arsenic.

Step 4: Conclude and exclude. Option A (arsenic) is correct; cadmium, mercury, and lead also cause nephropathy but the muscle pain clue identifies arsenic.

Quick Tip: Nephropathy is nonspecific; the muscle pain clue points to one metal.

127. Which is the first organ to putrefy?

- (A) Brain
- (B) Heart
- (C) Prostate
- (D) Kidney

Correct Answer: (A) Brain

Solution:

Step 1: Putrefaction is the bacterial decomposition of soft tissues after death, and different organs putrefy at different rates depending on their water content, blood supply and bacterial load.

Step 2: The classical order of internal putrefaction (earliest to latest) is: larynx and trachea, then stomach and intestine, then liver and spleen, then brain and lungs, then heart and kidney, then bladder and uterus or prostate, then skin, muscle and tendon, and finally bone.

Step 3: Among the four options listed, the brain decomposes earliest. The brain is soft, rich in water and lipids, and is enclosed in a closed cavity, so it liquefies relatively early compared with the heart, kidney and prostate.

Step 4: The heart, kidney and prostate all putrefy later in the sequence, so option A (Brain) is the correct answer among the given choices.

Quick Tip: The soft, lipid-rich organ in the cranial cavity decays earliest among these.

128. Locard is famous for:

- (A) Theory of exchange
- (B) Fingerprint study
- (C) Formula for estimation of stature
- (D) System of personal identification using body measurements

Correct Answer: (A) Theory of exchange

Solution:

Step 1: Edmond Locard was a French forensic scientist regarded as a pioneer of trace evidence analysis.

Step 2: He is famous for Locard's exchange principle, also called the theory of exchange, which states that every contact leaves a trace - whenever two objects come into contact, there is an exchange of material between them.

Step 3: The other options belong to different scientists. Fingerprint study is linked to Galton, Henry and Faulds; the formula for estimation of stature from long bones is linked to Karl Pearson and Trotter and Gleser; and personal identification using body measurements (anthropometry) is the Bertillon system.

Step 4: Therefore the correct answer is the theory of exchange (option A).

Quick Tip: Every contact leaves a trace - whose principle is that?

129. When does the basiocciput fuse with the basisphenoid?

- (A) 18 to 22 years
- (B) 22 to 25 years
- (C) 14 to 16 years
- (D) 12 to 14 years

Correct Answer: (A) 18 to 22 years

Solution:

Step 1: The spheno-occipital synchondrosis is the cartilaginous junction between the basisphenoid and the basiocciput at the skull base, and its fusion is used as an age estimation marker in forensic practice.

Step 2: This synchondrosis fuses relatively late, at about 18 to 21 years of age, making the option of 18 to 22 years the best fit.

Step 3: Fusion of this joint indicates that the individual has reached late adolescence to early adulthood, which is helpful when other epiphyseal markers are equivocal.

Step 4: The younger ranges (12 to 14 and 14 to 16 years) are too early, so option A (18 to 22 years) is correct.

Quick Tip: The speno-occipital synchondrosis fuses in late teens to early twenties.

130. What is the smell of a mummified body?

- (A) Odourless
- (B) Putrid
- (C) Pungent
- (D) Offensive

Correct Answer: (A) Odourless

Solution:

Step 1: Mummification is a modification of putrefaction in which the body dries and shrivels instead of liquefying. It occurs in dry, warm conditions with good air circulation.

Step 2: Because the tissues dehydrate rapidly, bacterial decomposition is arrested. In classical embalmed mummies, the internal organs (the main drivers of decay) are removed and the body is dried with desiccating salts such as natron.

Step 3: Since active putrefaction does not proceed, the foul gases responsible for the bad smell are not produced. As a result a mummified body is essentially

odourless.

Step 4: Putrid, pungent and offensive smells are features of ordinary putrefaction, not mummification, so option A (Odourless) is correct.

Quick Tip: Drying halts decay, so the gases that smell bad are never produced.

131. A patient presents with proximal tubule proteinuria. Which metal is most likely associated with it?

- (A) Cadmium
- (B) Mercury
- (C) Gold
- (D) Lead

Correct Answer: (A) Cadmium

Solution:

Step 1: Chronic exposure to certain heavy metals damages the renal tubules. The proximal convoluted tubule is responsible for reabsorbing low molecular weight proteins, so injury here causes tubular (low molecular weight) proteinuria.

Step 2: Cadmium is the classic cause of proximal tubular dysfunction. Occupational or environmental cadmium exposure produces early kidney damage with tubular proteinuria, marked by increased urinary beta-2 microglobulin.

Step 3: Cadmium nephropathy is a recognised feature of itai-itai disease and chronic industrial exposure, where it injures the proximal tubule.

Step 4: Lead causes Fanconi-type changes mainly in children and chronic interstitial disease; mercury and gold are more often linked with membranous

nephropathy and glomerular (nephrotic) proteinuria. Hence cadmium (option A) is the best answer.

Quick Tip: Think of itai-itai disease and low molecular weight tubular proteinuria.

132. Which of the following constitutional articles is NOT related to children?

- (A) Article 23
- (B) Article 21-A
- (C) Article 42
- (D) Article 24

Correct Answer: (C) Article 42

Solution:

Step 1: Several articles of the Indian Constitution specifically safeguard children. Article 21-A guarantees free and compulsory education for children aged 6 to 14 years.

Step 2: Article 24 prohibits employment of children below 14 years in hazardous work, and Article 23 protects against trafficking and forced or bonded labour, which also protects children.

Step 3: Article 42, however, directs the State to make provision for just and humane conditions of work and for maternity relief. It concerns workers and maternity benefits, not children directly.

Step 4: Therefore the article NOT related to children is Article 42 (option C).

Quick Tip: One of these is about humane working conditions and maternity relief, not children.

133. Which of the following statements regarding the Factory Act is correct?

- (A) A child under 14 years can do serious work to earn more money
- (B) Children under 14 years are not employed under the Factory Act
- (C) More than 72 hours of work per week is allowed
- (D) More than 82 hours of work per week is allowed

Correct Answer: (B) Children under 14 years are not employed under the Factory Act

Solution:

Step 1: The Factories Act regulates employment, working hours and safety of workers in factories and contains specific protection for children and adolescents.

Step 2: The Act prohibits employment of children below 14 years of age. Persons aged 15 to 18 years are classed as adolescents and need a fitness certificate before employment.

Step 3: The Act limits adult working hours to a maximum of 48 hours per week and not more than 9 hours per day, with at least a half-hour rest after 5 hours of continuous work. This makes the 72-hour and 82-hour options clearly wrong.

Step 4: Allowing a child under 14 to do serious work for more money is illegal, so option A is false. The correct statement is that children under 14 years are not employed under the Factory Act (option B).

Quick Tip: The Act bans employing children below 14 and caps work at 48 hours a week.

134. The incidence of a disease is 4 per 1000 of population with a duration of 2 years. Calculate the prevalence.

- (A) 8/1000
- (B) 4/1000
- (C) 2/1000
- (D) 6/1000

Correct Answer: (A) 8/1000

Solution:

Step 1: Prevalence, incidence and duration of disease are linked by the standard relationship used in epidemiology when the situation is in a steady state.

Step 2: The formula is $P = I \times D$, where P is prevalence, I is incidence rate and D is the average duration of the disease.

Step 3: Substituting the given values, $I = 4/1000$ and $D = 2$ years:

$$P = \frac{4}{1000} \times 2 = \frac{8}{1000}.$$

Step 4: Hence the prevalence is 8 per 1000, which is option A.

Quick Tip: Prevalence = Incidence x Duration.

135. Disposal of cytotoxic and expired drugs is done by which method?

- (A) Dumping
- (B) Autoclave
- (C) Landfill
- (D) Burning

Correct Answer: (C) Landfill

Solution:

Step 1: Cytotoxic drugs and expired pharmaceuticals are hazardous waste and must be disposed of in a way that prevents environmental contamination and human exposure.

Step 2: As per biomedical waste handling rules, expired and discarded cytotoxic drugs are categorised for disposal by secured or engineered landfill (encapsulation and inertisation) or return to the manufacturer.

Step 3: Autoclaving is meant for infectious waste such as cultures and sharps, not for chemical drug waste, and open dumping is unsafe and not permitted.

Step 4: Routine open burning is also not appropriate because cytotoxic agents need controlled high-temperature incineration; among the options given, secured landfill is the recognised method, so option C is correct.

Quick Tip: Hazardous chemical drug waste goes to secured landfill, not the autoclave.

136. For the net reproduction rate (NRR) to be 1, the couple protection rate should be:

- (A) 50%
- (B) 60%
- (C) 55%
- (D) 75%

Correct Answer: (B) 60%

Solution:

Step 1: Couple protection rate (CPR) is an indicator of the prevalence of contraceptive practice in a community. It is the percentage of eligible couples effectively protected against childbirth by an approved family planning method such as sterilisation, IUD, condom or oral contraceptive pills.

Step 2: The net reproduction rate (NRR) of 1 means each woman is, on average, replaced by exactly one daughter who survives to reproductive age - this represents the goal of achieving a stable, non-growing population.

Step 3: To reach NRR equal to 1, the couple protection rate must exceed 60 percent in the community.

Step 4: Therefore the required CPR is 60 percent, which is option B.

Quick Tip: $NRR = 1$ needs couple protection rate above 60%.

137. The new RNTCP online software to monitor the TB control programme is:

- (A) NIKSHAY
- (B) NICHAY
- (C) E-DOTS
- (D) NIRBHAI

Correct Answer: (A) NIKSHAY

Solution:

Step 1: The Revised National Tuberculosis Control Programme (RNTCP) needed a system to track tuberculosis patients across the country in real time.

Step 2: NIKSHAY is the web-enabled application introduced by the Government of India for this purpose. The name combines the Hindi words NI and KSHAY, meaning eradication of tuberculosis.

Step 3: It was developed jointly by the Central TB Division of the Ministry of Health and Family Welfare and the National Informatics Centre, and was launched in June 2012 to enable universal monitoring of TB patient data.

Step 4: The other options are not the TB monitoring software, so the correct answer is NIKSHAY (option A).

Quick Tip: The name combines Hindi words meaning eradication of TB.

138. The unit of study in an ecological study is:

- (A) Population
- (B) Patient
- (C) Community
- (D) Case

Correct Answer: (A) Population

Solution:

Step 1: An ecological study, also called a correlational study, is a type of observational study where the unit of analysis is a group rather than an individual.

Step 2: In ecological studies the unit of observation is the population or community. Disease rates and exposures are measured across a series of populations and their relationship is examined.

Step 3: The data are usually drawn from published statistics, which makes such studies quick and inexpensive but prone to the ecological fallacy.

Step 4: Since the analysis is at the level of populations, not individual patients or cases, the correct answer is Population (option A).

Quick Tip: Ecological studies analyse groups, not individuals.

139. In a screening test for diabetes mellitus, out of 1000 population, 90 were positive. The gold standard test was then done, in which 100 were positive. Calculate the sensitivity.

- (A) 90/100
- (B) 100/110
- (C) 80/100
- (D) 100/100

Correct Answer: (A) 90/100

Solution:

Step 1: Sensitivity is the ability of a screening test to correctly identify those who truly have the disease. It is calculated as **Sensitivity** = $\frac{a}{a+c}$, where **a** is true positives and **c** is false negatives.

Step 2: The gold standard shows 100 people truly have diabetes. The screening test detected 90 positives, all assumed to be true positives, so **a** = 90.

Step 3: The remaining diseased persons missed by the screening test are false negatives: **c** = 100 – 90 = 10.

Step 4: Therefore

$$\text{Sensitivity} = \frac{90}{90 + 10} = \frac{90}{100}.$$

The correct answer is option A.

Quick Tip: Sensitivity = true positives / all diseased (true positives + false negatives).

140. What is the mass chemoprophylaxis for meningococcal meningitis?

- (A) Rifampicin
- (B) Chloramphenicol
- (C) Tetracycline
- (D) Penicillin

Correct Answer: (A) Rifampicin

Solution:

Step 1: Meningococcal meningitis spreads from person to person, so chemoprophylaxis is given to high-risk close contacts to eradicate nasopharyngeal carriage.

Step 2: Rifampicin is the recommended drug of choice for chemoprophylaxis. The dose is 5 mg/kg every 12 hours for 2 days in infants under 1 month and 10 mg/kg every 12 hours for 2 days in those over 1 month.

Step 3: Alternatives such as ceftriaxone (single intramuscular dose) and ciprofloxacin (single oral dose in adults) are also acceptable but rifampicin is the standard answer.

Step 4: Chloramphenicol, tetracycline and penicillin are not the preferred prophylactic agents, so the correct answer is Rifampicin (option A).

Quick Tip: Drug of choice to clear nasopharyngeal carriage in close contacts.

141. Which among the following is the active form of chlorine in chlorination?

- (A) Hypochlorite ion
- (B) Hydrogen chloride
- (C) Hypochlorous acid
- (D) Chloride ion

Correct Answer: (C) Hypochlorous acid

Solution:

Step 1: When chlorine is added to water for disinfection, it reacts to form hypochlorous acid and the hypochlorite ion, which together make up free residual chlorine.

Step 2: The disinfecting action of chlorine is predominantly due to hypochlorous acid, the most effective form.

Step 3: Hypochlorous acid is about 70 to 80 times more effective as a germicide than the hypochlorite ion because it is uncharged and penetrates the bacterial cell wall easily.

Step 4: Therefore the active form responsible for disinfection is hypochlorous acid (option C); the hypochlorite ion and chloride ion are far less or non-active.

Quick Tip: The uncharged species is far stronger than the hypochlorite ion.

142. Kala-azar is found in all of the following endemic areas EXCEPT:

- (A) West Bengal
- (B) Uttar Pradesh
- (C) Bihar
- (D) Assam

Correct Answer: (D) Assam

Solution:

Step 1: Kala-azar, or visceral leishmaniasis, is transmitted by the sandfly and shows a strong geographic clustering in eastern India.

Step 2: The major endemic states are Bihar, West Bengal, Jharkhand and Uttar Pradesh, with Bihar carrying the highest burden of cases.

Step 3: Assam has historically reported kala-azar but is not part of the core list of classical endemic states given here; the question treats it as the exception.

Step 4: Since West Bengal, Uttar Pradesh and Bihar are all endemic, the answer to the EXCEPT question is Assam (option D).

Quick Tip: Bihar, West Bengal, Jharkhand and UP form the endemic belt.

143. The risk among the exposed divided by the risk among the non-exposed is defined as:

- (A) Relative risk
- (B) Odds ratio
- (C) Attributable risk
- (D) None of the above

Correct Answer: (A) Relative risk

Solution:

Step 1: The measure described is a ratio of two risks, one in an exposed group and one in a non-exposed group.

Step 2: In epidemiology, relative risk (risk ratio) is defined as the ratio of the probability of an event occurring in an exposed group to the probability of the event occurring in a non-exposed group:

$$RR = \frac{\text{incidence in exposed}}{\text{incidence in non-exposed}}.$$

Step 3: Attributable risk is instead the difference (subtraction) between the two incidences, and the odds ratio uses odds rather than risks, so they do not match the definition.

Step 4: Therefore the correct answer is Relative risk (option A).

Quick Tip: A ratio (not a difference) of two incidences.



144. Pasteurization of milk by the holder method is done at:

- (A) 73 degrees C for 20 minutes
- (B) 63 degrees C for 30 minutes
- (C) 72 degrees C for 30 seconds
- (D) 63 degrees C for 30 seconds

Correct Answer: (B) 63 degrees C for 30 minutes

Solution:

Step 1: Pasteurization is controlled heating of milk to kill pathogenic organisms while preserving its nutritive and physical properties.

Step 2: The holder (low temperature long time) method heats milk to about 63 degrees C and maintains that temperature for 30 minutes, which matches option B.

Step 3: The alternative flash or HTST method uses a higher temperature of about 72 degrees C held for 15 seconds, followed by rapid cooling.

Step 4: The other listed options use mismatched temperature-time pairs, so the correct holder method answer is 63 degrees C for 30 minutes (option B).

Quick Tip: Holder method = low temperature, long time.



145. The ideal time gap between two live vaccinations is:

- (A) 2 weeks
- (B) 4 weeks
- (C) 8 weeks
- (D) 12 weeks

Correct Answer: (B) 4 weeks

Solution:

Step 1: Two live vaccines can be given on the same day at the same visit without any problem.

Step 2: However, if two live parenteral vaccines (such as MMR, MMRV, varicella, zoster and yellow fever) or the live intranasal influenza vaccine are not given together, the first one can blunt the immune response to the second.

Step 3: To avoid this interference, they should be separated by an interval of at least 4 weeks.

Step 4: Therefore the ideal minimum gap between two live vaccines given on different days is 4 weeks (option B).

Quick Tip: Give them together, or separate by at least a month.

146. A susceptible person develops disease within the range of the incubation period after coming in contact with a primary case. This is measured by:

- (A) Secondary attack rate
- (B) Case fatality rate
- (C) Primary attack rate
- (D) Tertiary attack rate

Correct Answer: (A) Secondary attack rate

Solution:

Step 1: The scenario describes new (secondary) cases arising among contacts of an index case within the incubation period of the disease.

Step 2: The secondary attack rate (SAR) is defined as the number of exposed persons developing the disease within the range of the incubation period following exposure to a primary case, expressed as a proportion of susceptible contacts.

Step 3: It is a good measure of the infectivity or communicability of an agent and is often calculated within households.

Step 4: Case fatality rate measures deaths among cases and the primary attack rate refers to the index outbreak cases, so the correct answer is Secondary attack rate (option A).

Quick Tip: Measures spread to contacts within one incubation period.

147. Out of 100 women offered oral contraceptive pills (OCP) for contraception, 10 women became pregnant when followed for 24 months. What is the Pearl index?

- (A) 10
- (B) 5
- (C) 4
- (D) 2

Correct Answer: (B) 5

Solution:

Step 1: The Pearl index measures contraceptive failure as the number of accidental pregnancies per 100 woman-years of exposure.

Step 2: The formula is

$$\text{Pearl index} = \frac{\text{Number of accidental pregnancies} \times 1200}{\text{Total months of exposure}},$$

where 1200 converts months to 100 woman-years (100 women x 12 months).

Step 3: Here 10 pregnancies occurred and the total exposure is 100 women x 24 months = 2400 woman-months. Substituting:

$$\text{Pearl index} = \frac{10 \times 1200}{2400} = \frac{12000}{2400} = 5.$$

Step 4: Therefore the Pearl index is 5, which is option B.

Quick Tip: Pearl index = (pregnancies x 1200) / total woman-months.

148. Which of the following does not cause hardness of water?

- (A) Calcium carbonate
- (B) Calcium sulphate
- (C) Calcium bicarbonate
- (D) Magnesium bicarbonate

Correct Answer: (A) Calcium carbonate

Solution:

Step 1: Hardness of water is the presence of dissolved salts of calcium and magnesium. It is divided into temporary and permanent hardness based on the salt responsible.

Step 2: Temporary hardness is due to dissolved bicarbonates, namely calcium bicarbonate and magnesium bicarbonate. It is removed by simple boiling, which precipitates the carbonate.

Step 3: Permanent hardness is due to dissolved sulphates and chlorides, chiefly

calcium sulphate, and is not removed by boiling.

Step 4: Calcium carbonate is essentially insoluble in plain water, so it does not stay dissolved and therefore does not contribute to hardness. Options B (calcium sulphate), C (calcium bicarbonate) and D (magnesium bicarbonate) are all soluble salts that do cause hardness. Hence the correct answer is calcium carbonate.

Quick Tip: Hardness needs a soluble salt; this carbonate is practically insoluble.

149. Which of the following is not an example of direct transmission in communicable diseases?

- (A) Transplacental (vertical)
- (B) Soil
- (C) Respiratory
- (D) STD

Correct Answer: (C) Respiratory

Solution:

Step 1: Modes of transmission of infectious disease are broadly classified as direct and indirect.

Step 2: Direct transmission includes direct contact, droplet infection, contact with soil, inoculation into skin or mucosa, and transplacental (vertical) spread. Sexually transmitted diseases occur through direct contact, so STD is direct.

Step 3: Indirect transmission includes vehicle-borne (water, food, milk), vector-borne, and airborne spread.

Step 4: Respiratory or airborne spread (through suspended droplet nuclei and dust over a distance) is classified under indirect transmission, not direct. Therefore the answer is Respiratory. Soil contact, transplacental spread and STD are all direct routes.

Quick Tip: Airborne droplet nuclei travel through a medium, so it is indirect.

150. Water's view is used to obtain diagnostic information of:

- (A) Maxillary sinus
- (B) Ethmoidal sinuses
- (C) Frontal sinus
- (D) Sphenoid sinus

Correct Answer: (A) Maxillary sinus

Solution:

Step 1: The Waters' view, also called the occipitomeatal view, is a radiographic projection of the skull used in sinus imaging.

Step 2: The X-ray beam is angled at 45° to the orbitomeatal line, passing from behind the head perpendicular to the film. This tilt projects the petrous bones below the maxillary antra.

Step 3: By clearing the petrous ridges, the view gives an unobstructed picture of the maxillary sinuses, which is its primary use.

Step 4: Frontal and ethmoidal sinuses are better seen on the Caldwell (occipitofrontal) view, and the sphenoid is seen on lateral or submentovertical views. Hence the Waters' view answers for the maxillary sinus.

Quick Tip: Occipitomeatal 45 degree view clears the petrous bones off the antra.

151. Tracheostomy indication is:

- (A) Vocal cord replacement
- (B) Pharynx replacement
- (C) Tracheomalacia
- (D) Foreign body obstructing airway

Correct Answer: (D) Foreign body obstructing airway

Solution:

Step 1: Tracheostomy is creation of an opening into the trachea to secure or bypass the airway.

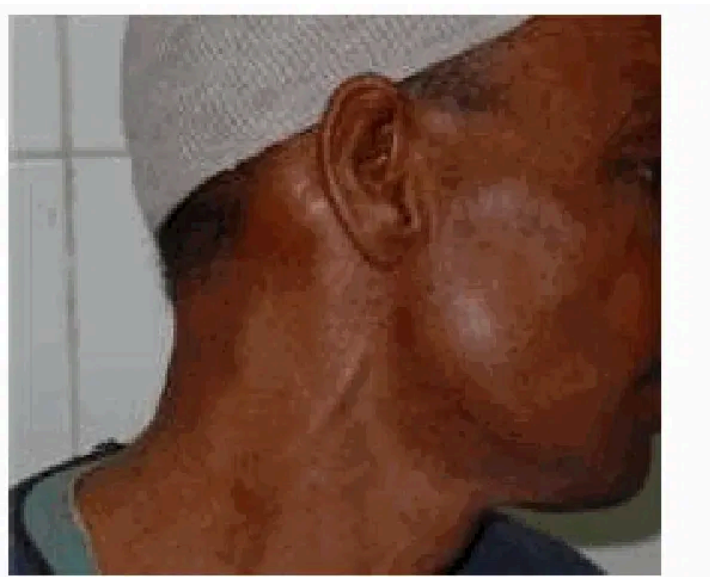
Step 2: The principal indications are upper respiratory tract obstruction from laryngeal, supralaryngeal and tracheal causes (the causes of stridor), and lower respiratory tract problems such as retained secretions and respiratory failure needing prolonged ventilation.

Step 3: A foreign body obstructing the airway is a classic example of upper airway obstruction that may require an emergency surgical airway, so it is a valid indication.

Step 4: Vocal cord replacement and pharynx replacement are not real procedures or indications, and tracheomalacia is managed differently. Hence the answer is foreign body obstructing airway.

Quick Tip: Pick the genuine cause of acute upper airway obstruction.

152.



Which is the thickened nerve shown here?

- (A) Facial nerve
- (B) Greater auricular nerve
- (C) Vagus nerve
- (D) Glossopharyngeal nerve

Correct Answer: (B) Greater auricular nerve

Solution:

Step 1: The image shows a visibly thickened cutaneous nerve crossing the side of the neck, a position that points to a superficial cervical plexus branch.

Step 2: The greater auricular nerve is a cutaneous branch of the cervical plexus arising from the ventral rami of C2 and C3, with most fibres from C2. It supplies skin of the auricle, the skin over the parotid gland and mastoid, and the deep layer of the parotid fascia.

Step 3: It emerges at the posterior border of the sternocleidomastoid at Erb's point (punctum nervosum) and ascends obliquely across the muscle, where it is the most easily palpable and visible superficial nerve - so it is the one that appears thickened in the photograph.

Step 4: The facial, vagus and glossopharyngeal nerves are deep cranial nerves not visible as a subcutaneous cord on the lateral neck, so they are excluded. The answer is the greater auricular nerve.

Quick Tip: Superficial C2-C3 cutaneous nerve crossing sternocleidomastoid.

153. Caldwell's view is used for:

- (A) Maxillary sinus
- (B) Frontal sinus
- (C) Ethmoidal sinus
- (D) All of the above

Correct Answer: (B) Frontal sinus

Solution:

Step 1: Caldwell's view, also called the occipitofrontal view, is a radiographic projection of the skull for sinus assessment.

Step 2: The X-ray plate is angled at 20° to the orbitomeatal line, with rays passing from behind the head perpendicular to the plate.

Step 3: This angulation projects the petrous ridges into the lower orbit and gives the best view of the frontal sinuses, with the ethmoid air cells also reasonably shown.

Step 4: The maxillary sinuses are better demonstrated on the Waters' view, so the single best answer here is frontal sinus.

Quick Tip: Occipitofrontal 20 degree view best shows the frontal sinus.

154. Presbyopic correction in an old patient is:

- (A) +1 D
- (B) +2 D
- (C) +3 D
- (D) +4 D

Correct Answer: (C) +3 D

Solution:

Step 1: Presbyopia is the age-related loss of accommodation, so the patient needs a near-add convex (plus) lens for reading.

Step 2: The amount of add increases with age as accommodative amplitude falls. By the time a person is elderly the residual accommodation is essentially gone and the maximum add is reached.

Step 3: The standard near add ceiling in an old patient is about **+3.0 D**, which is the value used for the oldest age group.

Step 4: Smaller adds of **+1 D** or **+2 D** are used in younger presbyopes (around

40-50 years), and **+4D** is not a routine near add. Hence the correction in an old patient is **+3D**.

Quick Tip: Near add rises with age and tops out around this plus value in the elderly.



155. 100 day glaucoma is seen in which of the following conditions?

- (A) Central retinal vein occlusion (CRVO)
- (B) Neovascular glaucoma
- (C) Central retinal artery occlusion (CRAO)
- (D) Steroid induced glaucoma

Correct Answer: (A) Central retinal vein occlusion (CRVO)

Solution:

Step 1: The term 100 day glaucoma refers to a neovascular (haemorrhagic) glaucoma that classically follows central retinal vein occlusion.

Step 2: After an ischaemic CRVO there is venous stasis, recurrent retinal haemorrhages, and the retina and optic disc become hypoxic.

Step 3: Hypoxia drives neovascularization of the retina, disc and iris (rubeosis); new vessels block the angle and raise intraocular pressure, producing neovascular glaucoma.

Step 4: This typically appears about three months (roughly 100 days) after the venous occlusion, which is why it is called 100 day glaucoma. Although the mechanism is neovascular glaucoma, the underlying condition asked for is CRVO, so the answer is central retinal vein occlusion.

Quick Tip: Rubeotic glaucoma about 3 months after a retinal vein blockage.



156. Roth spots are seen in:

- (A) Uveal melanoma
- (B) Acute leukaemia
- (C) Both a and b
- (D) None of the above

Correct Answer: (B) Acute leukaemia

Solution:

Step 1: Roth spots are retinal haemorrhages that have a characteristic white or pale centre.

Step 2: The pale centre is composed of coagulated fibrin with platelets, focal ischaemia, inflammatory infiltrate, infectious organisms, or neoplastic cells.

Step 3: They are classically described in leukaemia, and are also seen in diabetes, subacute bacterial endocarditis, pernicious anaemia, ischaemic events, hypertensive retinopathy and rarely HIV retinopathy.

Step 4: Uveal melanoma is a tumour of the uvea and does not produce Roth spots. Among the options the recognised association is acute leukaemia, so that is the answer.

Quick Tip: White-centred retinal haemorrhage classically links to a blood cancer.

157. The yoke muscle of the right lateral rectus is:

- (A) Left medial rectus
- (B) Left superior rectus
- (C) Left lateral rectus
- (D) Left inferior oblique

Correct Answer: (A) Left medial rectus

Solution:

Step 1: Yoke muscles are contralaterally paired extraocular muscles in the two eyes that contract together to move both eyes in the same direction of gaze

(Hering's law).

Step 2: The right lateral rectus abducts the right eye, turning the gaze to the right.

Step 3: For the left eye to follow the gaze to the right, the left medial rectus must adduct it. So the right lateral rectus and left medial rectus act as a yoke pair.

Step 4: The other left muscles serve different gaze directions, so the yoke of the right lateral rectus is the left medial rectus.

Quick Tip: For rightward gaze, the partner that adducts the other eye.

158. Severe (hyperacute) conjunctivitis is caused by:

- (A) Neisseria
- (B) Staphylococcus
- (C) Streptococcus
- (D) Haemophilus

Correct Answer: (A) Neisseria

Solution:

Step 1: Bacterial conjunctivitis is graded by severity into acute, hyperacute and chronic forms, each with typical organisms.

Step 2: Common acute bacterial conjunctivitis is caused by Staphylococcus aureus, Streptococcus pneumoniae and Haemophilus influenzae.

Step 3: The hyperacute (severe) form, with copious purulent discharge, is caused by Neisseria gonorrhoeae or N. meningitidis. Neisseria gonorrhoeae can produce severe ulcerative keratitis that may rapidly progress to corneal perforation.

Step 4: Because the question asks for the severe form, the answer is Neisseria, while the staphylococcal, streptococcal and haemophilus organisms cause the milder acute or chronic forms.

Quick Tip: Copious purulent hyperacute discharge points to a gram-negative

diplococcus.



159. Which is an example of simple myopic astigmatism among the prescriptions given below?

- (A) Rx (+) sphere
- (B) Rx will be plano (-)
- (C) Rx will be (-) sphere
- (D) $(-)(+)$ $(+)(-)$ on both 90 and 180 degree axis

Correct Answer: (B) Rx will be plano (-)

Solution:

Step 1: Refractive prescriptions are classified by the type and sign of the spherical and cylindrical components.

Step 2: In simple myopic astigmatism one principal meridian is emmetropic and the other is myopic, so there is no spherical correction and only a minus cylinder is needed. The prescription reads as plano sphere with a minus cylinder, written plano (-).

Step 3: For comparison: simple hyperopia is a (+) sphere, simple myopia is a (-) sphere, and mixed astigmatism shows opposite signs $(-)(+)$ $(+)(-)$ on the 90 and 180 degree axes.

Step 4: Therefore the prescription matching simple myopic astigmatism is plano (-), option B.

Quick Tip: One meridian emmetropic, other myopic - plano sphere with minus cylinder.



160. Blow out fracture of the orbit involves the:

- (A) Floor
- (B) Medial wall
- (C) Lateral wall
- (D) Roof

Correct Answer: (A) Floor

Solution:

Step 1: A blow out fracture is produced by a sudden rise in intraorbital pressure that fractures the thinnest part of the bony orbit.

Step 2: The orbital floor is the most common site. The infraorbital neurovascular bundle runs in the floor, and the bone over this canal is only about 0.23 mm thick, with the posteromedial floor about 0.37 mm thick.

Step 3: By contrast the lateral part of the floor averages about 1.25 mm, over five times thicker, so the fracture occurs at the very thin area over the neurovascular bundle.

Step 4: Because the floor is the weakest wall and the usual site, the answer is floor. The medial wall is also thin but the floor is the classic blow out site.

Quick Tip: Thinnest wall over the infraorbital canal gives way first.

161.



Which type of retractor is shown in the image?

- (A) Morris retractor
- (B) Czerny retractor
- (C) Richardson retractor
- (D) Lower lid retractor

Correct Answer: (A) Morris retractor

Solution:

Step 1: The image shows a hand-held deep abdominal retractor with a broad right-angled blade used to hold back the abdominal wall.

Step 2: This is the Morris retractor, used by surgeons and gynaecologists to work in the deep layers of the patient.

Step 3: It is particularly used when abdominal incisions are made and closed, allowing the surgeon a clear field of vision and access to move within and repair the body cavity.

Step 4: The Czerny, Richardson and lower lid retractors have different blade shapes and uses, so the instrument shown is the Morris retractor.

Quick Tip: Broad angled-blade deep abdominal retractor used in laparotomy.

162.



Which of the following statements is true about the suture material in the image?

- (A) Made of rabbit submucosa
- (B) Made of cat submucosa
- (C) Not degraded
- (D) Degraded by enzymatic degradation

Correct Answer: (D) Degraded by enzymatic degradation

Solution:

Step 1: The image shows catgut, a natural absorbable suture material.

Step 2: Despite the name, catgut is not made from cats; it is derived from sheep submucosa or beef (cow) serosa.

Step 3: Being a natural protein (collagen), catgut is broken down in the wound by proteolytic enzymes, that is by enzymatic degradation.

Step 4: So the true statement is that it is degraded by enzymatic degradation. It is not made of rabbit or cat submucosa, and it is certainly degraded, ruling out the other options.

Quick Tip: Natural collagen suture from sheep or beef, digested by enzymes.

163. The Van Nuys prognostic index is not based on:

- (A) Age
- (B) Microcalcification
- (C) Size
- (D) ER status

Correct Answer: (D) ER status

Solution:

Step 1: The Van Nuys Prognostic Index (VNPI) is used to guide management of ductal carcinoma in situ (DCIS) of the breast.

Step 2: It scores four parameters, each from 1 to 3: tumour size, margin width, nuclear grade (with or without necrosis), and patient age.

Step 3: ER (oestrogen receptor) status is not one of the VNPI parameters, so a prognostic score that omits ER status is the correct odd one out.

Step 4: Age, size and grade (which microcalcification reflects in DCIS imaging) are part of the index, so the answer is ER status.

Quick Tip: VNPI uses size, margin, grade and age - not the receptor profile.

164. The common cause of chronic pancreatitis is:

- (A) Chronic alcohol
- (B) Chronic pancreatic calculi
- (C) Pancreas divisum
- (D) Gall bladder stones

Correct Answer: (A) Chronic alcohol

Solution:

Step 1: Chronic pancreatitis is progressive inflammation leading to irreversible damage and fibrosis of the pancreas.

Step 2: Worldwide, chronic alcohol consumption and abuse is the leading cause, associated with up to 70% of cases.

Step 3: Pancreatic calculi are usually a consequence rather than the primary cause, and pancreas divisum is an uncommon congenital contributor.

Step 4: Gall bladder stones classically cause acute (gallstone) pancreatitis, not chronic pancreatitis. Hence the common cause is chronic alcohol.

Quick Tip: Gallstones cause acute; the chronic form is mostly alcohol related.

165. The following statement about keloid is true:

- (A) It contains growth factor
- (B) Extended excision is the treatment of choice
- (C) It does not extend beyond the wound
- (D) None of the above

Correct Answer: (A) It contains growth factor

Solution:

Step 1: A keloid is an abnormal scar in which excessive collagen is laid down beyond the limits of the original wound, driven by overactive fibroblasts.

Step 2: Keloid formation is mediated by elevated growth factors such as TGF-beta that stimulate this excessive matrix production, so the statement that it contains growth factor is true.

Step 3: Surgical excision alone is not the treatment of choice because keloids recur, often worse, after excision; treatment combines excision with intralesional steroids, pressure or radiation.

Step 4: By definition a keloid extends beyond the original wound margin (unlike a hypertrophic scar), so option C is false. Therefore the true statement is that it contains growth factor.

Quick Tip: Excess TGF-beta driven scar that recurs after excision and crosses the wound edge.

166. Which of the following layers are cut during fasciotomy?

- (A) Skin
- (B) Skin + subcutaneous fascia
- (C) Skin + subcutaneous tissue + superficial fascia
- (D) Skin + subcutaneous tissue + superficial fascia + deep fascia

Correct Answer: (D) Skin + subcutaneous tissue + superficial fascia + deep fascia

Solution:

Step 1: Fasciotomy is a surgical procedure that completely opens the fascial envelope to relieve raised pressure, most often to treat acute compartment syndrome.

Step 2: The raised pressure sits within the compartment bounded by the deep fascia, so to decompress it the surgeon must divide every layer down to and including the deep fascia.

Step 3: This means incising skin, then subcutaneous tissue, then the superficial fascia, and finally the tight deep fascia that forms the compartment wall.

Step 4: Only cutting up to the deep fascia relieves the pressure and restores circulation, so the answer is skin + subcutaneous tissue + superficial fascia + deep fascia.

Quick Tip: To decompress, you must divide the constricting deep fascia.

167. Which statement is not true regarding Crohn's disease?

- (A) Rectum is not involved
- (B) Continuous lesion visualized on endoscopy
- (C) Non caseating granulomas
- (D) Cobblestone appearance

Correct Answer: (B) Continuous lesion visualized on endoscopy

Solution:

Step 1: Crohn's disease is a transmural inflammatory bowel disease that can affect any part of the gut from mouth to anus.

Step 2: A hallmark feature is skip lesions - discontinuous areas of active disease separated by normal-looking bowel. So the lesions are NOT continuous on endoscopy.

Step 3: The statement that the lesion is continuous on endoscopy is therefore false; continuous involvement is a feature of ulcerative colitis, not Crohn's disease.

Step 4: The other statements are true of Crohn's: the rectum is often spared, non-

caseating granulomas are characteristic, and the mucosa shows a cobblestone appearance. Hence the untrue statement is continuous lesion on endoscopy.

Quick Tip: Crohn's gives skip lesions; continuous spread is ulcerative colitis.

168. Which is the best investigation for carcinoma of the head of pancreas?

- (A) Guided biopsy
- (B) ERCP
- (C) Transduodenal / transperitoneal sampling
- (D) EUS

Correct Answer: (A) Guided biopsy

Solution:

Step 1: Carcinoma of the head of pancreas is investigated to obtain a tissue diagnosis when imaging suggests a mass.

Step 2: Image-guided biopsy, for example percutaneous needle biopsy under ultrasound or CT guidance, can confirm the diagnosis histologically.

Step 3: However these tumours are highly vascular, so there is a recognised risk of haemorrhage with the guided biopsy.

Step 4: Among the listed options, guided biopsy is the one that provides the definitive tissue diagnosis, so it is taken as the answer; ERCP, transduodenal sampling and EUS are adjuncts.

Quick Tip: Tissue diagnosis comes from an image-guided needle of the mass.

169. In congenital hypertrophic pyloric stenosis, the abdominal mass is best demonstrated:

- (A) On palpation over the epigastrium
- (B) In the left hypochondrium
- (C) During feeding
- (D) In the right iliac fossa

Correct Answer: (C) During feeding

Solution:

Step 1: Congenital hypertrophic pyloric stenosis presents around 3 to 6 weeks of age, classically in a first-born male, with non-bilious projectile vomiting after feeds. The hypertrophied pyloric muscle forms a firm, olive-shaped lump in the epigastrium.

Step 2: The standard bedside method to demonstrate the mass is the test feed. The infant is fed milk from a bottle while the surgeon palpates the relaxed abdomen with a warm hand. As the stomach fills and the baby settles, the pyloric olive becomes easiest to feel and visible peristaltic waves cross the upper abdomen. Hence the mass is best demonstrated during feeding.

Step 3: Why the other options are weaker. Simply palpating over the epigastrium without a feed often misses the small lump because the crying, tense infant guards the abdomen. The left hypochondrium and the right iliac fossa are wrong anatomical sites - the pylorus lies in the epigastrium toward the right upper quadrant, not in the iliac fossa. Ultrasonography is the investigation of choice for confirmation.

Quick Tip: Think of the test feed, when the relaxed infant lets you feel the olive.

170. Calculate the Glasgow Coma Scale of a 25-year-old head injury patient who is confused, opens eyes in response to pain, and localises to pain.

- (A) 6
- (B) 11
- (C) 12
- (D) 7

Correct Answer: (B) 11

Solution:

Step 1: The Glasgow Coma Scale is the sum of the best eye opening (E, score 1 to 4), best verbal response (V, score 1 to 5) and best motor response (M, score 1 to 6).

Step 2: Score each component. "Opens eyes in response to pain" gives $E = 2$. "Confused" speech corresponds to disoriented or confused conversation, which is $V = 4$. "Localises pain" is $M = 5$.

Step 3: Add them up.

$$GCS = E + V + M = 2 + 4 + 5 = 11$$

So the total is 11. The other options arise from mis-scoring a component, for example taking eye opening as 3 (to speech) or motor as 6 (obeys commands).

Quick Tip: Eyes to pain (2) + confused speech (4) + localises pain (5).

171. The RET proto-oncogene is associated with the development of:

- (A) Medullary carcinoma of the thyroid
- (B) Astrocytoma
- (C) Paraganglioma
- (D) Hurthle cell tumour of the thyroid

Correct Answer: (A) Medullary carcinoma of the thyroid

Solution:

Step 1: RET is a receptor tyrosine kinase (a growth factor receptor) that binds the glial cell line derived neurotrophic factor family and supports neural cell survival during development. It is normally expressed in the parafollicular C cells of the thyroid, the adrenal medulla and parathyroid cell precursors.

Step 2: An activating point mutation in the RET extracellular domain causes the receptor to dimerise and signal constantly without ligand. In the C cells this drives medullary thyroid carcinoma, and the same germline mutation underlies MEN 2A and MEN 2B, which also feature pheochromocytoma and parathyroid disease. Therefore RET is most directly linked to medullary carcinoma of the thyroid.

Step 3: Why the others are wrong. Astrocytomas relate to other pathways and are not RET-driven. Paragangliomas are typically associated with SDH gene mutations, not classically RET. Hurthle cell (oncocytic follicular) tumours of the thyroid arise from follicular cells and are not a RET-associated tumour.

Quick Tip: RET drives the C-cell (calcitonin) thyroid cancer of MEN 2.

172. The size cut-off for surgical repair of an asymptomatic abdominal aortic aneurysm is:

- (A) 5.5 cm
- (B) 6.5 cm
- (C) 7.5 cm
- (D) 8.5 cm

Correct Answer: (A) 5.5 cm

Solution:

Step 1: The risk of rupture of an abdominal aortic aneurysm rises sharply once the diameter exceeds a threshold, and elective repair is offered when the rupture risk outweighs the operative risk.

Step 2: For an asymptomatic aneurysm, repair (open prosthetic graft or endovascular aortic stent graft) is indicated when the maximum diameter is

greater than 5.5 cm. Repair is also indicated, irrespective of size, if the aneurysm is symptomatic or is expanding rapidly (more than about 0.5 cm in a year). Hence the cut-off here is 5.5 cm.

Step 3: Why the larger numbers are wrong. Waiting until 6.5, 7.5 or 8.5 cm exposes the patient to a far higher and unacceptable rupture risk; below 5.5 cm an asymptomatic aneurysm is usually managed by surveillance imaging and cardiovascular risk control.

Quick Tip: Repair an asymptomatic AAA once it exceeds 5.5 cm.



173. The tendons affected in De Quervain tenosynovitis are those of:

- (A) Abductor pollicis longus and extensor pollicis brevis
- (B) Adductor pollicis longus and extensor pollicis brevis
- (C) Abductor pollicis longus and flexor pollicis brevis
- (D) Adductor pollicis longus and flexor pollicis brevis

Correct Answer: (A) Abductor pollicis longus and extensor pollicis brevis

Solution:

Step 1: De Quervain tenosynovitis is a stenosing tenosynovitis of the first dorsal compartment of the wrist, the fibro-osseous tunnel on the radial side of the wrist over the radial styloid.

Step 2: The first dorsal compartment transmits two tendons: the abductor pollicis longus and the extensor pollicis brevis. Thickening of the sheath around these two tendons causes pain on thumb movement and a positive Finkelstein test. So the correct pair is abductor pollicis longus and extensor pollicis brevis.

Step 3: Why the others are wrong. There is no muscle called adductor pollicis longus, so options containing it are anatomically invalid. The flexor pollicis brevis lies in the palm and is not part of the first dorsal compartment, so it is not involved.

Quick Tip: First dorsal compartment of the wrist = APL + EPB.

174.



A patient with a history of road traffic accident 2 years back now develops pain and swelling at the same site. The X-ray shows the features below. What is the diagnosis?

- (A) Osteogenic sarcoma
- (B) Ewing's sarcoma
- (C) Chronic osteomyelitis
- (D) Multiple myeloma

Correct Answer: (C) Chronic osteomyelitis

Solution:

Step 1: The history of a previous injury at the same site followed years later by pain and swelling, together with the radiograph, points to a chronic bone infection rather than a fresh tumour. This is the picture of Garre sclerosing osteomyelitis, a form of chronic non-suppurative osteomyelitis.

Step 2: In Garre osteomyelitis low-grade inflammation stimulates subperiosteal bone deposition. The X-ray shows periosteal proliferation surrounded by successive layers of dense cortical bone, giving the classic onion-skin layering.

Because the bone is reactive and the process is indolent, the diagnosis is chronic osteomyelitis.

Step 3: Why the others are wrong. Osteogenic sarcoma produces a sunburst pattern and Codman triangle, not orderly concentric layers. Ewing sarcoma can also give onion-skin periosteal reaction, but it is a tumour of young children with a permeative lytic lesion and systemic features, not a sequel to old trauma. Multiple myeloma causes multiple punched-out lytic lesions in older adults, which does not fit this localized post-traumatic lesion.

Quick Tip: Old trauma site, late pain, layered sclerotic periosteal bone (Garre).

175. What is meant by a perilunate dislocation?

- (A) Lower radius, scaphoid, lunate and capitate all in the same plane
- (B) Lower radius, scaphoid and capitate in alignment, lunate alone out of plane
- (C) Lower radius, scaphoid and lunate in alignment, capitate alone out of plane
- (D) Both the lunate and capitate are out of plane

Correct Answer: (B) Lower radius, scaphoid and capitate in alignment, lunate alone out of plane

Solution:

Step 1: Perilunate dislocation is a high-energy carpal injury caused by traumatic rupture of the radioscaphocapitate ligament, the scapholunate interosseous ligament and the lunotriquetral interosseous ligament. The carpus dislocates around the lunate.

Step 2: On the lateral radiograph there is loss of the normal collinearity of the radius, lunate and capitate. The capitate is displaced (usually dorsally) off the lunate, while the lunate itself stays seated in the radius. In other words the radius, scaphoid and capitate line up and the lunate is the bone left out of alignment. This corresponds to option B.

Step 3: Why the others are wrong. If all four bones were in the same plane there would be no dislocation at all. "Capitate alone out of plane" reverses the

relationship described above. "Both lunate and capitate out of plane" describes a lunate dislocation pattern rather than the perilunate one asked about.

Quick Tip: Lunate stays in the radius; the capitate and carpus dislocate around it.

176.



Identify the numbered bone in the X-ray below that most commonly fractures when a person falls on an outstretched hand.

- (A) 1
- (B) 2
- (C) 3
- (D) 4

Correct Answer: (A) 1

Solution:

Step 1: A fall on an outstretched hand transmits force up the wrist. In older adults, especially post-menopausal women with osteoporotic bone, this force most commonly fractures the distal radius, the broad bone of the forearm that

forms the major part of the wrist joint.

Step 2: A distal radius fracture presents with rapid pain, swelling, bruising and often a visible wrist deformity. The marked bone numbered 1 corresponds to the distal radius, so option 1 is correct.

Step 3: Specific named patterns of distal radius fracture include the Colles fracture (dorsal angulation), the Smith fracture (volar angulation), the Barton and the Hutchinson (radial styloid) fractures. The other numbered bones do not represent the radius and are not the commonest bone to break in this mechanism in adults.

Quick Tip: FOOSH in an adult typically breaks the distal radius.

177. The fallen fragment sign is characteristic of:

- (A) Simple bone cyst
- (B) Osteosarcoma
- (C) Adamantinoma
- (D) Aneurysmal bone cyst

Correct Answer: (A) Simple bone cyst

Solution:

Step 1: The fallen fragment sign describes a piece of fractured cortical bone that has dropped to the dependent (lowest) part of a fluid-filled cystic bone lesion and is seen lying at the bottom of the cavity on imaging.

Step 2: This sign is considered pathognomonic for a simple (unicameral) bone cyst that has undergone a pathological fracture. Because the cyst contains only fluid, the loose cortical fragment is free to sink to the lowest point, which is what produces the sign. Hence the answer is simple bone cyst.

Step 3: Why the others are wrong. Osteosarcoma is a solid malignant matrix-forming tumour, so a fragment cannot fall through it. An aneurysmal bone cyst contains multiple blood-filled septated locules rather than a single fluid space. Adamantinoma is a solid lytic tumour of the tibia and does not show this sign.

Rarely the sign has been reported in eosinophilic granuloma, but the classic association remains the simple bone cyst.

Quick Tip: A chip sinks through clear fluid - a single-cavity unicameral cyst.

178. You are an intern in casualty. Among the following fracture patients, who should be your first priority to call the orthopaedic resident about?

- (A) A patient whose finger is blackening
- (B) A patient who cannot extend his arm
- (C) A 10 cm abrasion
- (D) An intra-articular fracture of the elbow joint

Correct Answer: (A) A patient whose finger is blackening

Solution:

Step 1: In triage of fracture patients, the priority is whatever threatens limb viability or life. Vascular compromise is a true emergency because tissue dies within hours without blood flow.

Step 2: Blackening of a finger after a fracture signals loss of blood supply (ischaemia heading toward gangrene). This is the most time-critical problem and demands the orthopaedic resident first. So option 1 is the correct first priority.

Step 3: Why the others can wait comparatively. Inability to extend the arm suggests a nerve or tendon problem that needs assessment but is not immediately limb-threatening. A 10 cm abrasion is a soft-tissue wound managed with cleaning and dressing. An intra-articular elbow fracture needs orthopaedic care and possibly surgery, but without vascular compromise it does not outrank a dying, blackening digit.

Quick Tip: Vascular compromise (a blackening, ischaemic digit) trumps everything.

179. In rheumatoid arthritis, which type of cell is prominently present in the hypertrophied synovial lining?

- (A) B cells
- (B) T cells
- (C) Macrophages
- (D) Dendritic cells

Correct Answer: (C) Macrophages

Solution:

Step 1: The synovial lining (intimal layer) is normally only 1 to 3 cells thick. In rheumatoid arthritis chronic inflammation makes this lining grossly hypertrophied, reaching 8 to 10 cells thick, forming the pannus.

Step 2: The two dominant cell populations in this thickened intimal layer are fibroblast-like synoviocytes and macrophages (macrophage-like synoviocytes). Among the options offered, macrophages are the prominent lining cell, so the correct answer is macrophages.

Step 3: Why the others are wrong here. T cells (mainly CD4+) and B cells accumulate in the deeper sublining as lymphoid aggregates and drive the autoimmune response, but they are not the predominant cells of the lining layer itself. Dendritic cells are present as antigen-presenting cells but are a minor population, not the prominent lining cell.

Quick Tip: The thickened RA synovial lining is fibroblasts plus macrophages.

180. The costal cartilages of the 8th and 9th ribs articulate with each other to form which type of joint?

- (A) Costochondral joint
- (B) Interchondral joint
- (C) Synovial joint
- (D) Costovertebral joint

Correct Answer: (C) Synovial joint

Solution:

Step 1: The costal cartilages of the 6th, 7th, 8th, 9th and 10th ribs are joined to one another along their adjacent borders. These connections between neighbouring costal cartilages are the interchondral articulations.

Step 2: Anatomically, these interchondral articulations between the lower costal cartilages are lined by a synovial cavity and so are synovial (plane) joints, which allow the slight gliding that accompanies respiration. Since the question asks for the type of joint, the answer is a synovial joint.

Step 3: Why the others are wrong. A costochondral joint is the union between a rib and its own costal cartilage (a primary cartilaginous joint), not between two cartilages. A costovertebral joint connects a rib to a vertebra. "Interchondral joint" names the location of these joints rather than the histological type asked for, and the histological type is synovial.

Quick Tip: Lower costal cartilages glide on each other via small synovial cavities.

181. Tom Smith septic arthritis refers to:

- (A) Acute gonococcal arthritis
- (B) Smallpox arthritis
- (C) Septic arthritis of infancy
- (D) Chronic pyogenic arthritis

Correct Answer: (C) Septic arthritis of infancy

Solution:

Step 1: Tom Smith septic arthritis is the eponym for septic arthritis of infancy, a pyogenic infection of the hip joint occurring in infants.

Step 2: Its onset is acute with rapid abscess formation that may burst spontaneously or be incised, after which it heals quickly but leaves the hip damaged. The telescope test is positive and the deformity clinically resembles a

congenital dislocation of the hip. Because the defining feature is its occurrence in infancy, the answer is septic arthritis of infancy.

Step 3: Why the others are wrong. Acute gonococcal arthritis is a sexually transmitted joint infection of adults. Smallpox arthritis is a separate viral arthropathy. Chronic pyogenic arthritis describes a long-standing infection rather than this specific infantile hip condition.

Quick Tip: Eponym for pyogenic septic arthritis of the infant hip.

182. Which fontanelle is the last to close?

- (A) Anterolateral
- (B) Anterior
- (C) Lateral
- (D) Occipital

Correct Answer: (B) Anterior

Solution:

Step 1: Fontanelles are the soft membranous gaps between the developing skull bones, and they close in a predictable sequence after birth as the bones ossify.

Step 2: The posterior (occipital) fontanelle closes first, by about 2 to 3 months; the sphenoidal fontanelle closes around 6 months; the mastoid fontanelle closes between 6 and 18 months; and the anterior fontanelle closes last, between about 18 and 24 months. Therefore the anterior fontanelle is the last to close.

Step 3: Why the others are wrong. The anterolateral (sphenoidal) and posterolateral (mastoid) fontanelles close earlier than the anterior one. The occipital (posterior) fontanelle is actually the first to close, the opposite of what is asked.

Quick Tip: The diamond-shaped anterior fontanelle closes at 18 to 24 months.

183. Lesch-Nyhan syndrome is caused by deficiency of which enzyme?

- (A) Hypoxanthine-guanine phosphoribosyltransferase (HGPRT)
- (B) Xanthine oxidase
- (C) Adenine phosphoribosyltransferase (APRT)
- (D) AMP deaminase

Correct Answer: (A) Hypoxanthine-guanine phosphoribosyltransferase (HGPRT)

Solution:

Step 1: Lesch-Nyhan syndrome, sometimes called juvenile gout, is a rare X-linked inherited disorder of purine metabolism caused by mutations in the HPRT gene on the X chromosome.

Step 2: The defective gene leads to deficiency of the enzyme hypoxanthine-guanine phosphoribosyltransferase (HGPRT). This enzyme normally salvages hypoxanthine and guanine back into nucleotides; without it, purines are degraded to excess uric acid. The result is hyperuricaemia with gout, plus neurological features such as choreoathetosis and compulsive self-mutilation. Hence the answer is HGPRT.

Step 3: Why the others are wrong. Xanthine oxidase deficiency causes xanthinuria, not Lesch-Nyhan. APRT deficiency causes 2,8-dihydroxyadenine stones. AMP deaminase deficiency causes a mild muscle exertional disorder. None reproduces the classic Lesch-Nyhan picture.

Quick Tip: X-linked purine salvage defect with self-mutilation and high uric acid.

184. Which vaccine is NOT included in the Mission Indradhanush?

- (A) Tuberculosis
- (B) Measles
- (C) Japanese encephalitis
- (D) Diphtheria

Correct Answer: (C) Japanese encephalitis

Solution:

Step 1: Mission Indradhanush is named after the seven colours of the rainbow and was launched to fully immunise children against seven vaccine-preventable diseases.

Step 2: The seven diseases originally targeted are diphtheria, pertussis, tetanus, childhood tuberculosis, polio, hepatitis B and measles. Japanese encephalitis is not part of this original list of seven, so it is the vaccine not included. Hence option 3 is correct.

Step 3: Why the others are wrong. Tuberculosis (BCG), measles and diphtheria are all on the core seven-disease list of the mission, so they are included and cannot be the answer.

Quick Tip: Indradhanush = 7 diseases (DPT, TB, polio, hepatitis B, measles).

185.



Identify the condition shown in the CT scan image below.

- (A) Dandy-Walker malformation
- (B) Cerebellar vermis hypoplasia
- (C) Mega cisterna magna
- (D) None

Correct Answer: (A) Dandy-Walker malformation

Solution:

Step 1: The CT image shows the classic posterior fossa abnormality of Dandy-Walker malformation. This is a developmental anomaly of the cerebellum and the fourth ventricle.

Step 2: The diagnostic triad is hypoplasia or agenesis of the cerebellar vermis, cystic dilatation of the fourth ventricle that fills an enlarged posterior fossa, and upward displacement of the tentorium and torcula. The large posterior fossa cyst continuous with the fourth ventricle, together with the splayed cerebellar hemispheres, identifies Dandy-Walker malformation. Hence option 1 is correct.

Step 3: Why the others are wrong. Isolated cerebellar vermis hypoplasia lacks the large communicating fourth-ventricle cyst and the enlarged posterior fossa. Mega cisterna magna is an enlarged cisterna magna with an intact vermis and normal fourth ventricle. Therefore the full picture shown is Dandy-Walker malformation, not these milder variants.

Quick Tip: Vermian agenesis + cystic 4th ventricle + enlarged posterior fossa.

186. Which is the most common cause of neonatal blindness?

- (A) Neisseria gonorrhoeae
- (B) Chlamydia trachomatis
- (C) Klebsiella
- (D) Enterobacter

Correct Answer: (A) Neisseria gonorrhoeae

Solution:

Step 1: Ophthalmia neonatorum is a purulent conjunctivitis occurring in the first four weeks of life, acquired by the baby during passage through an infected birth canal.

Step 2: The two leading organisms are *Neisseria gonorrhoeae* and *Chlamydia trachomatis*. Of these, gonococcal infection is the most concerning because it is highly aggressive, can rapidly cause corneal ulceration and perforation, and is therefore the most common infective cause of neonatal blindness. So the answer is *Neisseria gonorrhoeae*.

Step 3: Why the others are wrong. *Chlamydia* produces a milder inclusion conjunctivitis that less often blinds. *Klebsiella* and *Enterobacter* are uncommon causes of neonatal conjunctivitis and are not the classic blinding agents in this setting.

Quick Tip: Hyperacute purulent gonococcal conjunctivitis can melt the cornea.

187. Shoulder dystocia is managed by:

- (A) Sharp flexion of the hip joints towards the abdomen
- (B) Suprapubic pressure
- (C) 90 degree rotation of the posterior shoulder
- (D) Emergency caesarean section

Correct Answer: (B) Suprapubic pressure

Solution:

Step 1: Shoulder dystocia is an obstetric emergency where the fetal anterior shoulder impacts behind the maternal pubic symphysis after delivery of the head. Management follows the HELPER sequence.

Step 2: A key early and effective step is applying suprapubic pressure (the P in HELPER), which pushes the impacted anterior shoulder down and under the symphysis to disimpact it. Among the given options suprapubic pressure is the

standard manoeuvre, so option 2 is correct.

Step 3: Why the others are less right. Sharp flexion of the hips toward the abdomen is the McRoberts manoeuvre, which is helpful but the option here is phrased loosely and suprapubic pressure is the more specific listed answer. Rotational manoeuvres exist (Rubin and Woods) but are not simply a fixed 90 degree rotation of the posterior shoulder as worded. Emergency caesarean is a last resort, not the initial management of an already-delivered head.

Quick Tip: The 'P' in HELPERR - press just above the pubis to free the shoulder.

188.



Identify the uterine anomaly shown in the hysterosalpingogram (HSG) X-ray below.

- (A) Septate uterus
- (B) Uterus didelphys
- (C) Unicornuate uterus
- (D) Bicornuate uterus

Correct Answer: (C) Unicornuate uterus

Solution:

Step 1: The hysterosalpingogram opacifies the uterine cavity and fallopian tubes with contrast. The shape of the contrast-filled cavity reveals the type of Mullerian (congenital uterine) anomaly.

Step 2: The image shows a single, slender, banana-shaped or elongated cavity deviated to one side, filling only one cornu with a single tube. This is the classic HSG appearance of a unicornuate uterus, which results from the failure of one Mullerian duct to develop. Hence option 3 is correct.

Step 3: Why the others are wrong. A septate uterus shows a single external outline with two cavities separated by a septum. Uterus didelphys shows two completely separate cavities and cervices. A bicornuate uterus shows two cavities with a deep external fundal cleft. The solitary single-horn cavity here matches the unicornuate uterus.

Quick Tip: A single banana-shaped, off-midline cavity with one tube.

189. The most common karyotype in true hermaphroditism is:

- (A) 45 XO with streak gonads
- (B) 46 XX with ovotestis
- (C) 47 XY +9
- (D) 47 XX

Correct Answer: (B) 46 XX with ovotestis

Solution:

Step 1: True hermaphroditism, now called ovotesticular disorder of sexual differentiation (ovotesticular DSD), is one of the rarest intersex anomalies and is defined by the presence of both ovarian and testicular tissue (an ovotestis) in the same individual.

Step 2: In about 90 percent of cases the karyotype is 46 XX. Therefore the most common karyotype is 46 XX, and these patients have ovotestes. This makes

option 2 (46 XX with ovotestis) correct.

Step 3: Why the others are wrong. 45 X0 with streak gonads is Turner syndrome, not true hermaphroditism. 47 XY +9 is an unrelated trisomy and not a recognised ovotesticular karyotype. 47 XX is not a standard karyotype for this condition. Rarely 46 XY or 46 XX/46 XY mosaicism occurs, but the predominant karyotype is 46 XX.

Quick Tip: About 90 percent of true hermaphrodites are 46 XX with an ovotestis.



190. Peripartum cardiomyopathy occurs within which time period relative to delivery?

- (A) Within 7 days
- (B) Within 6 weeks
- (C) Within 24 months
- (D) Within 5 months

Correct Answer: (D) Within 5 months

Solution:

Step 1: Peripartum cardiomyopathy (PPCM) is a form of dilated cardiomyopathy with left ventricular systolic dysfunction that appears in the absence of any other identifiable cause of heart failure.

Step 2: By definition the disease presents in the last month of pregnancy or within the first five months after delivery, with ejection fraction usually falling below 45%.

Step 3: Because the window extends up to five months postpartum, option D is correct. Within 7 days and within 6 weeks are too short and would miss many cases, while within 24 months is far too long and would wrongly include unrelated cardiomyopathies.

Quick Tip: Onset extends from the last month of pregnancy to several months postpartum.

191. Which nerve is most commonly compressed during pregnancy and the puerperium?

- (A) Radial nerve
- (B) Median nerve
- (C) Femoral nerve
- (D) Facial nerve

Correct Answer: (C) Femoral nerve

Solution:

Step 1: Lower-limb nerve injuries in obstetrics arise mainly from prolonged lithotomy positioning, hip hyperflexion and fetal head pressure on the pelvic wall.

Step 2: The femoral nerve (and the closely related lateral femoral cutaneous nerve) is the lower-limb nerve most often compressed in labour because it runs under the inguinal ligament where sustained hip flexion compresses it.

Step 3: Hence option C is correct. The radial and median nerves are upper-limb nerves unrelated to obstetric positioning, and the facial nerve is cranial and not affected by labour mechanics.

Quick Tip: Prolonged hip flexion under the inguinal ligament is the culprit.

192. In pregnancy, which of the following is altered the most?

- (A) TSH
- (B) Free T3
- (C) Free T4
- (D) T3 binding globulin

Correct Answer: (C) Free T4

Solution:

Step 1: Estrogen rises in pregnancy and stimulates hepatic synthesis of thyroxine-binding globulin (TBG), roughly doubling its serum concentration.

Step 2: The increased TBG binds more thyroid hormone, lowering free T4. The fall in free T4 drives a compensatory rise in TSH and an increase in total thyroid hormone production.

Step 3: Among the listed parameters the free T4 level is the one most directly and measurably shifted by this cascade, so option C is taken as correct per the recall key. TSH and free T3 change secondarily, and T3 binding globulin is not the standard transport protein referenced here.

Quick Tip: Estrogen-driven TBG rise binds hormone and lowers the free fraction.

193. Paget's disease of this type is associated with cancer of which organ?

- (A) Vulva
- (B) Vagina
- (C) Cervix
- (D) Uterus

Correct Answer: (A) Vulva

Solution:

Step 1: Extramammary Paget's disease (EMPD) is a rare, slow-growing intraepithelial adenocarcinoma that arises in skin bearing apocrine glands, outside the breast.

Step 2: In the female genital tract the classic site is the vulva, where it presents as a chronic eczematous, well-demarcated plaque and may be linked to an underlying adnexal or visceral adenocarcinoma.

Step 3: Therefore option A is correct. The vagina, cervix and uterus are lined by mucosa without the apocrine-rich skin in which Paget's disease typically develops.

Quick Tip: Think of apocrine-bearing skin of the female genital tract.

194. What is meant by superfecundation?

- (A) Fertilization of two or more ova in one intercourse
- (B) Fertilization of two or more ova in different intercourses in the same menstrual cycle
- (C) Fertilization of an ovum and then its division
- (D) Fertilization of a second ovum, the first being already implanted

Correct Answer: (B) Fertilization of two or more ova in different intercourses in the same menstrual cycle

Solution:

Step 1: Superfecundation refers to the fertilization of two or more ova released in the same menstrual cycle by sperm from separate acts of intercourse.

Step 2: Because the fertilizing sperm can come from different episodes (and potentially different men), it can produce dizygotic twins with two different biological fathers.

Step 3: Option B captures this exactly. Option A omits the separate intercourses, option C describes monozygotic splitting, and option D describes superfetation (fertilization in a later cycle while a pregnancy already exists).

Quick Tip: Same cycle, separate acts of intercourse fertilizing different ova.

195. The fetal heart starts contracting at approximately what age of gestation?

- (A) 10-12 days
- (B) 10-12 weeks
- (C) 3-5 weeks
- (D) 3-5 months

Correct Answer: (C) 3-5 weeks

Solution:

Step 1: The primitive heart tube forms during the third week of development from the cardiogenic mesoderm.

Step 2: Spontaneous contractions begin around day 22 to 23, that is roughly the start of the fourth week, which falls within the 3 to 5 week range.

Step 3: Hence option C is correct. 10 to 12 days is too early (the heart tube has not yet formed), while 10 to 12 weeks and 3 to 5 months are far too late.

Quick Tip: The heart is the first organ to function, beating around day 22.

196. Which is the anaesthesia of choice for caesarean section in severe pre-eclampsia?

- (A) Spinal
- (B) General anaesthesia
- (C) Epidural
- (D) Spinal plus epidural

Correct Answer: (C) Epidural

Solution:

Step 1: In severe pre-eclampsia the goals are stable blood pressure, good uteroplacental perfusion and avoidance of a difficult airway.

Step 2: Continuous epidural anaesthesia gives a gradual, titratable block that avoids the abrupt hypotension of single-shot spinal and improves uteroplacental perfusion while reducing catecholamine surges.

Step 3: It also avoids general anaesthesia, where laryngeal and airway edema make intubation hazardous and laryngoscopy can spike blood pressure. Thus option C is preferred over spinal (B), GA and combined techniques per the recall key.

Quick Tip: A titratable block avoids airway risk and abrupt hypotension.

197. Which of the following is NOT a high-risk pregnancy?

- (A) Previous history of manual removal of placenta
- (B) Anemia
- (C) Diabetes
- (D) Obesity

Correct Answer: (A) Previous history of manual removal of placenta

Solution:

Step 1: A high-risk pregnancy is one with maternal or fetal factors that raise the chance of adverse outcomes during pregnancy, labour or the puerperium.

Step 2: Anemia raises maternal and perinatal mortality and prematurity, diabetes increases cardiac and fetal complications, and obesity predisposes to gestational diabetes and difficult delivery, so all three are recognised high-risk factors.

Step 3: A single past episode of manual removal of placenta, by itself, is not a standard high-risk label for the next pregnancy. Hence option A is the answer.

Quick Tip: Three options are active maternal diseases; one is a past procedure.

198. Which of the following drugs is NOT used in pre-eclampsia?

- (A) Methyldopa
- (B) Atenolol
- (C) Labetalol
- (D) Hydralazine

Correct Answer: (B) Atenolol

Solution:

Step 1: The antihypertensives of choice in pregnancy include methyldopa, labetalol and hydralazine, all with established safety profiles.

Step 2: Atenolol, a beta-blocker, is avoided in pregnancy because it is associated with fetal growth restriction when used for prolonged periods.

Step 3: Therefore option B is the drug not used. Methyldopa is a classic oral agent, labetalol is widely used orally and intravenously, and hydralazine is a standard agent for acute severe hypertension.

Quick Tip: One beta-blocker is linked to fetal growth restriction.

199. Dilatation and curettage (D&C) is contraindicated in which condition?

- (A) Pelvic inflammatory disease (PID)
- (B) Endometriosis
- (C) Ectopic pregnancy
- (D) None

Correct Answer: (A) Pelvic inflammatory disease (PID)

Solution:

Step 1: Dilatation and curettage involves opening the cervix and instrumenting the uterine cavity, which can push infection upward through the genital tract.

Step 2: In active pelvic inflammatory disease this instrumentation can spread infection and worsen the condition, so D&C is contraindicated until the infection is controlled.

Step 3: Hence option A is correct. Endometriosis and ectopic pregnancy are not absolute contraindications to D&C in the way active pelvic infection is, and indeed procedures on the upper genital tract are themselves a risk factor for PID.

Quick Tip: Instrumenting an actively infected tract spreads the infection.

200. Which of the following statements regarding the placenta and umbilical cord is correct?

- (A) The placental artery provides nutrients through the umbilical cord to the baby
- (B) The cord has Wharton's jelly
- (C) The cord has 2 veins and 1 artery
- (D) Estrogen is secreted only by the placenta

Correct Answer: (B) The cord has Wharton's jelly

Solution:

Step 1: The umbilical cord connects the fetus to the placenta and carries the umbilical vessels embedded in a gelatinous matrix.

Step 2: That matrix is Wharton's jelly, which cushions and supports the vessels and prevents kinking, so option B is correct.

Step 3: The cord has two arteries and one vein, not two veins and one artery, so option C is wrong. Nutrient and oxygen-rich blood reaches the fetus through the umbilical vein, not an artery, so option A is incorrect.

Quick Tip: Recall the protective gel and the true vessel count of the cord.

201. Acute fatty liver of pregnancy is commonly seen at which stage?

- (A) 3rd trimester
- (B) 1st trimester
- (C) Immediate postpartum
- (D) Intrapartum

Correct Answer: (A) 3rd trimester

Solution:

Step 1: Acute fatty liver of pregnancy (AFLP) is a rare but potentially fatal microvesicular fatty infiltration of the liver linked to disordered fatty-acid oxidation.

Step 2: It characteristically presents late, in the third trimester or the early postpartum period, with nausea, vomiting, jaundice and possible liver failure.

Step 3: Therefore option A, the third trimester, is the best answer. The first trimester, intrapartum period and immediate postpartum are not the typical window for its onset.

Quick Tip: This is a late-pregnancy hepatic emergency.

202. The establishment of fetoplacental circulation is seen at which day?

- (A) 11 to 13 days
- (B) 20 to 22 days
- (C) 7 days
- (D) 25 to 26 days

Correct Answer: (B) 20 to 22 days

Solution:

Step 1: After implantation the chorionic villi mature in stages: primary villi around day 13, secondary villi around day 16 and tertiary villi (containing fetal vessels) around day 21.

Step 2: Once tertiary villi carry functioning fetal capillaries and the fetal heart begins to beat (around day 21 to 22), true fetoplacental circulation is established.

Step 3: Hence option B, day 20 to 22, is correct. Day 7 marks early blastocyst attachment, day 11 to 13 corresponds to lacunar and primary-villi events, and day 25 to 26 is later than the recognised milestone.

Quick Tip: Fetoplacental flow needs tertiary villi plus a beating heart.

203. The fimbriectomy method of tubal sterilization is also known as which technique?

- (A) Uchida method
- (B) Irving method
- (C) Madlener technique
- (D) Kroener method

Correct Answer: (D) Kroener method

Solution:

Step 1: Several named techniques exist for tubal ligation, each defined by how the fallopian tube is handled.

Step 2: The Kroener method removes the fimbrial end of the tube, so it is the technique that corresponds to fimbriectomy, making option D correct.

Step 3: The other methods differ: the Uchida technique injects saline subserosally to raise a bleb, the Irving method buries the cut tubal ends, and the Madlener technique crushes a loop of tube with forceps. None of these is a fimbriectomy.

Quick Tip: Which eponymous method removes the fimbrial end of the tube?

204. What is the recommended dietary allowance (RDA) of iodine during lactation, in micrograms?

- (A) 150
- (B) 220
- (C) 100
- (D) 250

Correct Answer: (D) 250

Solution:

Step 1: Iodine demand rises in pregnancy and lactation because the element is needed for maternal and infant thyroid hormone synthesis and is secreted into breast milk.

Step 2: The RDA is 220 micrograms per day in pregnancy and is increased further to 250 micrograms per day during lactation to cover losses into milk.

Step 3: Hence option D, 250 micrograms, is correct. 150 micrograms is the requirement for non-pregnant adults, 220 micrograms applies to pregnancy, and 100 micrograms is below all of these requirements.

Quick Tip: Lactation needs more than the 220 mcg of pregnancy.

205. Which one of the following is NOT a cause of secondary postpartum haemorrhage?

- (A) Placenta previa
- (B) Retained bits of placenta
- (C) Endometritis
- (D) Polyp

Correct Answer: (A) Placenta previa

Solution:

Step 1: Secondary postpartum haemorrhage is abnormal bleeding from the genital tract occurring between 24 hours and 6 weeks after delivery.

Step 2: Its common causes are retained placental fragments, postpartum infection such as endometritis, and uterine polyps or fibroids, all of which can produce delayed bleeding.

Step 3: Placenta previa is a cause of antepartum haemorrhage and of primary postpartum bleeding, not secondary postpartum haemorrhage, so option A is the answer.

Quick Tip: One option belongs to antepartum or primary PPH, not the delayed type.

206. What is the best time to perform the quadruple (quad) test?

- (A) 8-12 weeks
- (B) 11-15 weeks
- (C) 15-20 weeks
- (D) 18-22 weeks

Correct Answer: (C) 15-20 weeks

Solution:

Step 1: The quadruple test is a second-trimester maternal serum screen measuring AFP, hCG, unconjugated estriol and inhibin A to assess risk of aneuploidy and neural tube defects.

Step 2: It is performed in the second trimester, most reliably between 15 and 20 weeks of gestation, so option C is correct.

Step 3: The 8 to 12 week and 11 to 15 week windows correspond to first-trimester screening, and 18 to 22 weeks is later than the optimal interval, making them less appropriate.

Quick Tip: It is a second-trimester serum screen.

207. Which drug is used to promote fetal lung maturity?

- (A) Dexamethasone
- (B) Folic acid
- (C) Beclomethasone
- (D) None

Correct Answer: (A) Dexamethasone

Solution:

Step 1: Antenatal corticosteroids accelerate fetal surfactant production and lung maturation, reducing respiratory distress in preterm neonates.

Step 2: Dexamethasone (and betamethasone) cross the placenta well and are the agents given to the mother in threatened preterm birth, so option A is correct.

Step 3: Folic acid prevents neural tube defects and has no role in lung maturity, and beclomethasone is an inhaled steroid for asthma that is not used to mature the fetal lung. None of those replaces dexamethasone here.

Quick Tip: A placenta-crossing glucocorticoid boosts surfactant.

208.



In a woman complaining of abnormal uterine bleeding (AUB), the image shown was seen on endoscopic (hysteroscopic) examination of the uterus. What is the diagnosis?

- (A) Leiomyoma
- (B) Adenomyosis
- (C) Ovarian neoplasm
- (D) Carcinoma of uterus

Correct Answer: (A) Leiomyoma

Solution:

Step 1: The hysteroscopic image shows a benign, well-circumscribed smooth-muscle tumour projecting into the uterine cavity, the appearance of a leiomyoma (fibroid).

Step 2: Leiomyomas are the most common pelvic tumour in women, arise from myometrial smooth muscle, and a submucous fibroid distorting the cavity readily produces abnormal uterine bleeding, matching this clinical picture.

Step 3: Therefore option A is correct. Adenomyosis is a diffuse myometrial process without a discrete intracavitary mass, an ovarian neoplasm would not be seen inside the uterine cavity on hysteroscopy, and carcinoma would show irregular friable tissue rather than a smooth fibroid.

Quick Tip: A smooth, well-defined intracavitary mass causing AUB.

209. In uterine prolapse managed with a ring pessary, how do you know the ring is correctly in place?

- (A) If it is not expelled after increased abdominal pressure
- (B) If bleeding does not occur
- (C) If the patient feels discomfort
- (D) None

Correct Answer: (A) If it is not expelled after increased abdominal pressure

Solution:

Step 1: A vaginal ring pessary is a removable device placed in the vagina to support pelvic organ prolapse.

Step 2: Correct fitting is confirmed when the pessary stays in position even when intra-abdominal pressure is raised, for example by coughing or straining or bearing down.

Step 3: Hence option A is correct. Absence of bleeding does not confirm correct

placement, and the patient feeling discomfort actually suggests an ill-fitting pessary rather than a correctly placed one.

Quick Tip: A well-fitted pessary stays put when the patient bears down.



210. Hormone therapy (HT) in menopausal women is indicated for which of the following?

- (A) Hot flashes
- (B) Carcinoma of the breast
- (C) Endometriosis
- (D) Uterine bleeding

Correct Answer: (A) Hot flashes

Solution:

Step 1: Menopausal hormone therapy replaces declining estrogen to relieve symptoms caused by estrogen deficiency.

Step 2: Approved indications include vasomotor symptoms such as hot flashes, sleep disturbance and vaginal dryness, and prevention of osteoporosis, so option A is correct.

Step 3: Breast carcinoma is a contraindication because estrogen can stimulate hormone-sensitive tumours, endometriosis is estrogen-dependent and would be aggravated, and unexplained uterine bleeding must be evaluated rather than treated with HT. These are not indications.

Quick Tip: HT treats estrogen-deficiency symptoms, not estrogen-driven disease.



211. Murphy's eye is seen in which device?

- (A) Macintosh laryngoscope
- (B) Endotracheal tube
- (C) LMA
- (D) Flexible laryngoscope

Correct Answer: (B) Endotracheal tube

Solution:

Step 1: Recall the structure of a standard endotracheal tube (ETT). Besides the main bevelled distal opening, most ETTs carry a small extra hole on the side wall near the tip. This side hole is called the Murphy eye.

Step 2: Understand its purpose. If the main distal opening becomes blocked, for example by pressing against the tracheal wall, secretions, or a clot, the Murphy eye acts as a vent so gas can still pass. This prevents complete airway obstruction.

Step 3: Eliminate the distractors. A Macintosh laryngoscope (option a) is a curved blade used to lift the epiglottis indirectly and has no such hole. An LMA (option c) is a supraglottic airway with a mask cuff, not an ETT side vent. A flexible laryngoscope (option d) is a viewing instrument. Hence the Murphy eye belongs to the endotracheal tube.

Quick Tip: It is a side vent hole near the tip of an airway tube that prevents total occlusion.

212. Modified Mallampati grading is used in the assessment of:

- (A) Difficult intubation
- (B) Airway obstruction
- (C) Death due to aspiration
- (D) Intubation

Correct Answer: (A) Difficult intubation

Solution:

Step 1: The Modified Mallampati classification grades how much of the oropharyngeal structures can be seen when the seated patient opens the mouth and protrudes the tongue maximally without phonating. It is a bedside airway examination.

Step 2: The grading runs Class I (soft palate, fauces, uvula and pillars visible) to Class IV (soft palate not visible at all). Higher classes correlate with a poorer view at laryngoscopy.

Step 3: Its clinical role is to predict a difficult airway, specifically difficult laryngoscopy and difficult intubation. It is a poor predictor of difficult mask ventilation. Therefore the correct use is anticipating difficult intubation (option a).

Step 4: The distractors are wrong because the test does not assess airway obstruction (option b), it does not estimate aspiration mortality (option c), and "intubation" alone (option d) is too vague - the test predicts the difficulty of intubation, not the act itself.

Quick Tip: It is a bedside oropharyngeal view score used to predict a difficult airway.

213. Which nerve is tested for adequacy of anaesthesia?

- (A) Median nerve
- (B) Ulnar nerve
- (C) Radial nerve
- (D) Mandibular nerve

Correct Answer: (A) Median nerve

Solution:

Step 1: To judge whether a regional or local block has taken effect, the clinician tests the sensory territory of the targeted nerve. If sensation is lost in that territory, the block is adequate.

Step 2: For the median nerve, the adequacy of the block can be evaluated by testing sensation over the lateral (radial) aspect of the ring finger, which lies within its cutaneous supply.

Step 3: The other options are less suited as the marker described here. The ulnar nerve supplies the medial side of the ring finger and the little finger, the radial nerve supplies the dorsum and the dorsal web space, and the mandibular nerve is a branch of the trigeminal supplying the face, not relevant to upper-limb block testing in this context. Hence the median nerve (option a) is the answer.

Quick Tip: Adequacy is checked over the lateral aspect of the ring finger.



214. The most effective breathing circuit during spontaneous ventilation is:

- (A) Mapleson A
- (B) Mapleson B
- (C) Mapleson C
- (D) Mapleson D

Correct Answer: (A) Mapleson A

Solution:

Step 1: The Mapleson circuits differ in how the fresh gas inlet, reservoir bag and expiratory valve are arranged, which changes how efficiently they avoid rebreathing under spontaneous versus controlled ventilation.

Step 2: The Mapleson A (Magill) circuit places the expiratory valve at the patient end. During spontaneous breathing, dead-space gas and fresh gas are conserved while alveolar gas is vented through the valve, so rebreathing is prevented at a

fresh gas flow close to the patient's minute ventilation. This makes it the most efficient circuit for spontaneous ventilation.

Step 3: The other circuits are less efficient for spontaneous breathing. Mapleson D (option d) is the most efficient for controlled ventilation, not spontaneous, and Mapleson B and C (options b and c) require high fresh gas flows in both modes. Therefore Mapleson A (option a) is correct.

Quick Tip: Think Magill circuit - valve at the patient end conserves fresh gas during spontaneous breathing.



215. What is the mechanism of action of curonium drugs as muscle relaxants?

- (A) Persistently depolarizing at the neuromuscular junction
- (B) Act competitively on acetylcholine receptors, blocking them post-synaptically
- (C) Repetitive stimulation of acetylcholine receptors on the muscle end plate
- (D) Inhibiting the calcium channel on the presynaptic membrane

Correct Answer: (B) Act competitively on acetylcholine receptors, blocking them post-synaptically

Solution:

Step 1: The "-curonium" drugs, such as pancuronium, vecuronium and rocuronium, are aminosteroid non-depolarising neuromuscular-blocking agents used to relax skeletal muscle and aid endotracheal intubation.

Step 2: Their mechanism is competitive antagonism. They bind reversibly to the nicotinic acetylcholine receptors on the post-synaptic muscle end plate and compete with acetylcholine, preventing it from opening the receptor channel. This blocks depolarisation and produces flaccid paralysis (option b).

Step 3: The distractors describe other mechanisms. Persistent depolarisation (option a) is how depolarising agents like succinylcholine act. Repetitive receptor

stimulation (option c) is not how relaxants work. Presynaptic calcium-channel inhibition (option d) describes agents like magnesium or aminoglycosides, not the curonium class. Hence option b is correct.

Quick Tip: Non-depolarising blockers compete with acetylcholine at the post-junctional nicotinic receptor.

216.



Identify the following lesion shown in the image.

- (A) Becker nevus
- (B) Hypopigmented macule
- (C) Spitz nevus
- (D) Epidermal nevus

Correct Answer: (A) Becker nevus

Solution:

Step 1: The lesion shown is a large, unilateral, hyperpigmented patch with overlying coarse hair, typically on the shoulder or upper trunk of an adolescent

male. This appearance is characteristic of a Becker nevus.

Step 2: A Becker nevus is a late-onset epidermal nevus (also called Becker melanosis) seen mostly in males. It results from an overgrowth of the epidermis, melanocytes and hair follicles, which explains the brown pigmentation and hypertrichosis.

Step 3: The distractors do not fit. A hypopigmented macule (option b) is pale, not pigmented or hairy. A Spitz nevus (option c) is a small pink-red dome-shaped papule, often on the face of a child. An epidermal nevus (option d) is a verrucous, often linear plaque without the typical hair-bearing pigmented patch. Hence the answer is Becker nevus (option a).

Quick Tip: A large hyperpigmented hairy patch on a young man's shoulder.

217. Cutis marmorata occurs due to exposure to:

- (A) Cold temperature
- (B) Dust
- (C) Hot temperature
- (D) Humidity

Correct Answer: (A) Cold temperature

Solution:

Step 1: Cutis marmorata is a transient skin change in which the skin develops a pinkish-blue mottled or marbled pattern. It is common in infancy and is seen in about half of children.

Step 2: The trigger is exposure to cold temperature. Cold causes the superficial small blood vessels of the skin to dilate and constrict unevenly at the same time, producing the reticulated marbled appearance.

Step 3: The change is physiological and reversible. Rewarming the skin restores its normal colour. This points to cold temperature as the cause (option a) and rules out dust, heat and humidity (options b, c and d), which do not produce this vascular mottling.

Quick Tip: A marbled mottling of infant skin that resolves on rewarming.

218.



A child has a rash as shown in the picture. The family history is positive for asthma. What is the most probable diagnosis?

- (A) Seborrheic dermatitis
- (B) Atopic dermatitis
- (C) Allergic contact dermatitis
- (D) Erysipelas

Correct Answer: (B) Atopic dermatitis

Solution:

Step 1: The key clinical clue is a child with a rash plus a family history of asthma. Asthma is part of the atopic triad, which also includes allergic rhinitis and atopic dermatitis. A positive atopic family history strongly favours atopic dermatitis.

Step 2: Atopic dermatitis in children typically presents as an itchy, erythematous, sometimes oozing eczematous rash, classically over the face and the flexures, and is closely linked with a personal or family history of asthma and allergic rhinitis.

Step 3: The distractors are less consistent. Allergic contact dermatitis needs a specific external allergen contact and is confined to the contact area, with no link to an asthma family history. Seborrheic dermatitis gives greasy yellow scales over sebaceous areas. Erysipelas is a sharply demarcated, hot, tender bacterial cellulitis of the dermis with fever, not an atopic eczema. Given the asthma family history, atopic dermatitis (option b) is the best answer.

Quick Tip: Asthma in the family is the atopic clue - think of the eczema of the atopic triad.

219. Which dye is used in the diagnosis of esophageal perforation?

- (A) Iohexol
- (B) Barium sulphate
- (C) Gadolinium
- (D) Iodine dye

Correct Answer: (A) Iohexol

Solution:

Step 1: When esophageal perforation is suspected, a contrast swallow study is performed to look for extravasation of contrast outside the lumen, which confirms the leak.

Step 2: The contrast must be chosen carefully. Barium, if it leaks into the mediastinum, causes a severe inflammatory mediastinitis. So a water-soluble agent is used first. Iohexol (Omnipaque) is a water-soluble, low-osmolar iodinated contrast that is safe to use when a perforation is suspected, making it the correct choice (option a).

Step 3: The distractors are unsuitable as the initial agent. Barium sulphate (option b) risks mediastinitis if it leaks. Gadolinium (option c) is an MRI contrast, not used for swallow fluoroscopy of perforation. "Iodine dye" (option d) is too non-specific compared with the named water-soluble agent iohexol. Note that small amounts of barium may be used only if no leak is seen on the initial water-soluble study.

Quick Tip: Suspected leak means use a water-soluble agent, not barium.



220. The Bragg peak effect is most pronounced in:

- (A) X-ray
- (B) Proton
- (C) Neutron
- (D) Electron

Correct Answer: (B) Proton

Solution:

Step 1: The Bragg peak is a sharp peak on the curve of energy loss versus depth as ionising radiation travels through matter. It marks the point where the particle deposits most of its energy just before coming to rest.

Step 2: The peak is characteristic of heavy charged particles - protons, alpha particles and other ions. As the particle slows, its stopping power rises (roughly as $1/v^2$), so energy deposition spikes right before it stops. This is the Bragg peak described by William Henry Bragg.

Step 3: Among the options, protons (option b) are heavy charged particles and show a pronounced Bragg peak, which is exploited in proton radiotherapy to spare deeper tissues. X-rays (option a) and electrons (option d) deposit dose differently and do not show this sharp distal peak, and uncharged neutrons (option c) do not produce a Bragg peak. Hence protons are correct.

Quick Tip: Heavy charged particles deposit a dose spike just before they stop.

221. Salt and pepper pot appearance of the skull is seen in:

- (A) Hyperparathyroidism
- (B) Multiple myeloma
- (C) Hyperthyroidism
- (D) Pseudo-hyperparathyroidism

Correct Answer: (A) Hyperparathyroidism

Solution:

Step 1: The salt and pepper (pepper-pot) skull describes multiple tiny radiolucent areas scattered through the skull vault, giving a granular, speckled appearance on the radiograph.

Step 2: This is classically caused by primary hyperparathyroidism. Excess parathyroid hormone drives extensive bone resorption, and in the skull this produces numerous small lytic areas together with cystic osteopenia, termed the pepper-pot skull (option a).

Step 3: The distractors are weaker. Multiple myeloma gives punched-out lytic lesions or the raindrop skull, sometimes loosely called pepper-pot but classically described separately. Hyperthyroidism and pseudohyperparathyroidism do not

produce this characteristic speckled vault. Therefore hyperparathyroidism is the correct answer.

Quick Tip: Diffuse fine lucent specks from high PTH-driven resorption.

222. All of the following imaging techniques are used in uterine anomalies EXCEPT:

- (A) HSG
- (B) MRI-guided HSG
- (C) CT-guided HSG
- (D) USG

Correct Answer: (C) CT-guided HSG

Solution:

Step 1: Congenital uterine anomalies are assessed by imaging that shows both the uterine cavity and the external contour. The standard modalities are ultrasound (USG), hysterosalpingography (HSG) and MRI.

Step 2: HSG outlines the endometrial cavity and tubal patency, USG and especially 3D USG show the cavity and outer contour, and MRI is excellent for distinguishing septate from bicornuate uterus. These are all established tools.

Step 3: CT-guided HSG (option c) is not a recognised technique for evaluating uterine anomalies. CT carries ionising radiation, has poor soft-tissue contrast for the uterus and offers no advantage here. So the EXCEPT answer is CT-guided HSG (option c).

Quick Tip: The radiation-heavy, poor soft-tissue option is the one not used.

223.



This spot radiograph is from a double-contrast esophagram. The image represents:

- (A) Esophageal atresia
- (B) Esophageal stenosis
- (C) Feline esophagus
- (D) Tracheoesophageal fistula

Correct Answer: (C) Feline esophagus

Solution:

Step 1: The image shows numerous fine 1-2 mm transverse radiolucent folds running across the esophagus in a herringbone-like pattern. These thin transverse bands are the hallmark of feline esophagus.

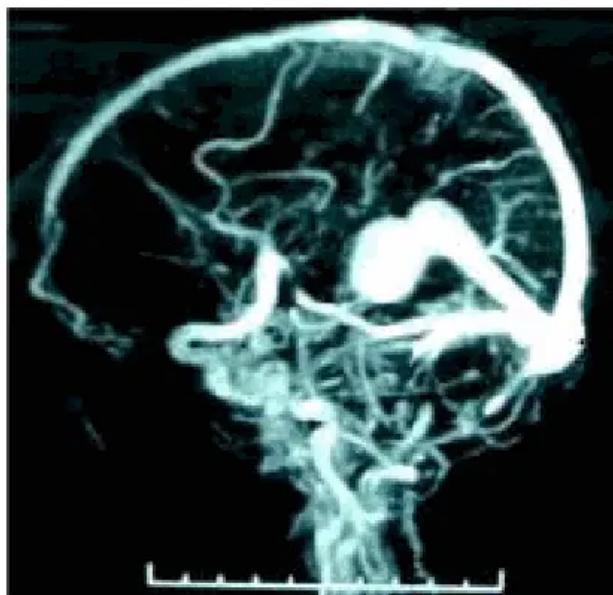
Step 2: Feline esophagus (also called esophageal shiver) refers to transient transverse folds in the mid and lower esophagus seen on a double-contrast barium swallow. They are caused by contraction of the muscularis mucosae, which shortens the esophagus and bunches the mucosa. The folds are transient and appear following reflux, not during swallowing.

Step 3: The distractors do not match. Esophageal atresia and tracheoesophageal

fistula are congenital lesions presenting in neonates, not fine transverse folds. Esophageal stenosis is a fixed narrowing. The transient circumferential fine folds make feline esophagus (option c) the answer, and they are strongly associated with gastroesophageal reflux.

Quick Tip: Transient fine transverse mucosal folds linked to reflux.

224.



This MRI of the skull represents:

- (A) Vein of Galen
- (B) Dandy-Walker syndrome
- (C) Pneumocephalus
- (D) Crouzon syndrome

Correct Answer: (A) Vein of Galen

Solution:

Step 1: The MRI shows a dilated midline venous structure lying beneath the cerebral hemispheres in the quadrigeminal cistern, consistent with the vein of

Galen (great cerebral vein), here seen as a vein of Galen malformation.

Step 2: The vein of Galen is a short trunk formed by the union of the two internal cerebral veins and the basal veins of Rosenthal. It curves around the splenium of the corpus callosum to drain into the straight sinus. A vein of Galen malformation appears as an enlarged midline venous pouch in this location.

Step 3: The distractors differ. Dandy-Walker syndrome shows a cystic dilatation of the fourth ventricle with cerebellar vermis hypoplasia. Pneumocephalus is intracranial air. Crouzon syndrome is a craniosynostosis with skull deformity. None matches the dilated midline vein, so vein of Galen (option a) is correct.

Quick Tip: A dilated midline vein in the quadrigeminal cistern behind the splenium.

225.



What is the diagnosis based on the given image?

- (A) Uterus didelphys
- (B) Bicornuate uterus
- (C) Unicornuate uterus
- (D) Septate uterus

Correct Answer: (C) Unicornuate uterus

Solution:

Step 1: The hysterosalpingogram shows a single, slender, banana-shaped endometrial cavity that tapers at the apex and drains into one fallopian tube, with the uterus shifted off the midline. This is the classic look of a unicornuate uterus.

Step 2: A unicornuate uterus (unicornis unicollis) is a class II Mullerian duct anomaly. It accounts for roughly 10 percent of uterine anomalies and is associated with miscarriage and infertility. The cavity is fusiform because only one Mullerian duct has developed.

Step 3: The distractors show different cavities. Uterus didelphys has two separate uteri and cervices. A bicornuate uterus has two horns with a single cervix and an indented fundus. A septate uterus has a normal external contour with a dividing septum. The single banana-shaped laterally deviated cavity fits unicornuate uterus (option c).

Quick Tip: A single banana-shaped cavity draining into one tube, shifted off midline.



226.



This X-ray of the skull shows which lesion?

- (A) Paget's disease
- (B) Multiple myeloma
- (C) Osteosarcoma
- (D) Osteomyelitis

Correct Answer: (A) Paget's disease

Solution:

Step 1: The skull radiograph shows a thickened diploe with ill-defined fluffy sclerotic areas, described as a cotton-wool appearance, most pronounced in the frontal bone. These features are characteristic of Paget disease of bone.

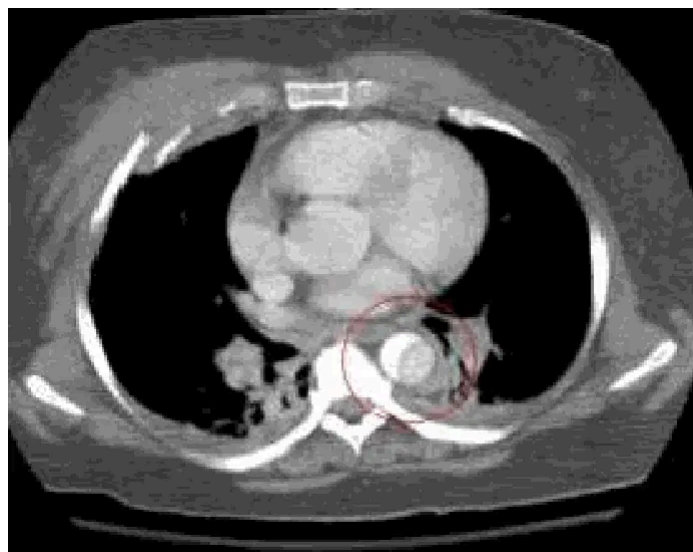
Step 2: Paget disease is a chronic disorder of excessive abnormal bone remodelling affecting the skull, pelvis, spine and long bones. In the skull it produces osteoporosis circumscripta in the early lytic phase, then coarsened trabeculae and the mixed lytic-sclerotic cotton-wool pattern with diploic widening.

Step 3: The distractors differ. Multiple myeloma gives multiple well-defined punched-out lytic lesions. Osteosarcoma shows an aggressive bone-forming

destructive lesion, uncommon in the skull. Osteomyelitis shows infective destruction with periosteal reaction. The cotton-wool diploic thickening points to Paget disease (option a).

Quick Tip: Cotton-wool fluffy sclerosis with widened diploe.

227.



This CT of the thorax represents:

- (A) Ascending aortic dissection
- (B) Descending aortic dissection
- (C) Aortic aneurysm
- (D) Cystic fibrosis

Correct Answer: (B) Descending aortic dissection

Solution:

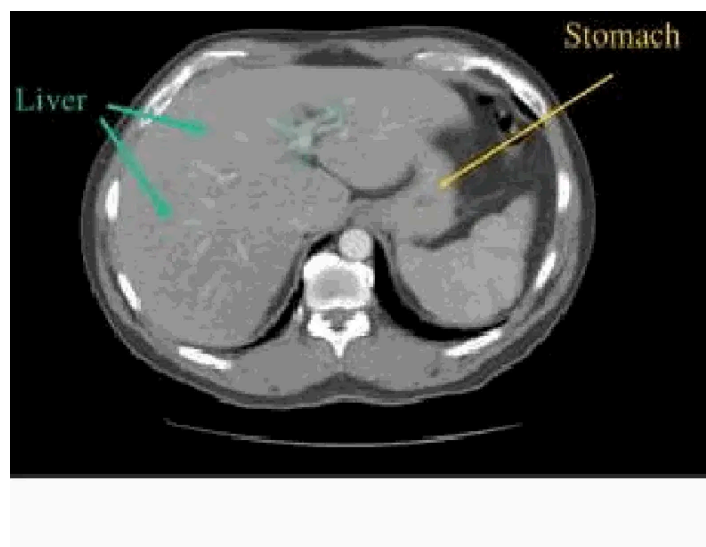
Step 1: The contrast-enhanced CT of the chest shows an intimal flap within the aorta separating a true and a false lumen, which is the diagnostic feature of aortic dissection. In this case the flap is located in the descending thoracic aorta.

Step 2: Aortic dissection occurs when an intimal tear lets blood track between the layers of the aortic wall, splitting them. CT with intravenous contrast demonstrates the two lumens. The position of the flap distal to the left subclavian, in the descending aorta, defines this as a descending (Stanford type B) dissection (option b).

Step 3: The distractors do not fit. An aneurysm is a focal dilatation without an intimal flap. Ascending dissection would show the flap in the ascending aorta. Cystic fibrosis is a lung disease showing bronchiectasis, not an aortic flap. So descending aortic dissection is correct.

Quick Tip: An intimal flap with true and false lumens, located beyond the arch.

228.



This CT scan of the abdomen shows a structure branching into the liver. Identify the structure.

- (A) SVC
- (B) IVC
- (C) Portal vein
- (D) Splenic vein

Correct Answer: (C) Portal vein

Solution:

Step 1: The CT shows a large vessel entering the liver at the porta hepatis and branching into the right and left intrahepatic divisions. The vessel that classically branches into the liver at the porta is the portal vein.

Step 2: The portal vein (hepatic portal vein) carries blood from the gastrointestinal tract, gallbladder, pancreas and spleen to the liver, delivering nutrients and toxins for processing. It supplies about 75 percent of total hepatic blood flow, the rest coming from the hepatic artery.

Step 3: The distractors are wrong. The SVC drains the upper body into the right atrium, in the thorax. The IVC runs posteriorly and drains into the right atrium; it does not branch into the liver parenchyma. The splenic vein drains the spleen and joins to form the portal vein but does not itself branch into the liver. So the branching structure is the portal vein (option c).

Quick Tip: The vessel entering the porta hepatis and dividing into the liver.



229.



Identify artery 'X' in the given angiography anatomy image.

- (A) Superior mesenteric artery
- (B) Subclavian artery
- (C) Celiac artery
- (D) Brachiocephalic artery

Correct Answer: (A) Superior mesenteric artery

Solution:

Step 1: The angiogram shows an anterior branch of the abdominal aorta arising at about the L1 level, just below the celiac trunk, that fans out to supply the small intestine and proximal colon. This branching pattern identifies the superior mesenteric artery (SMA).

Step 2: The SMA is the second of the three major anterior branches of the abdominal aorta. It supplies the midgut, from the major duodenal papilla to the proximal two-thirds of the transverse colon, and gives multiple jejunal and ileal branches plus the ileocolic, right colic and middle colic arteries, producing the characteristic arcade appearance.

Step 3: The distractors arise elsewhere. The subclavian and brachiocephalic

arteries are upper-thoracic vessels supplying the arm and head, not the abdomen. The celiac artery arises just above the SMA and supplies the foregut with a different, shorter branching pattern. The midgut arcade fits the superior mesenteric artery (option a).

Quick Tip: Anterior aortic branch at L1 below the celiac, feeding the midgut arcades.

230. The semen (squeeze) technique is used in the management of:

- (A) Erectile dysfunction
- (B) Premature ejaculation
- (C) Retrograde ejaculation
- (D) Antegrade ejaculation

Correct Answer: (B) Premature ejaculation

Solution:

Step 1: The squeeze technique is a behavioural method, a variation of the Masters and Johnson approach, used in sex therapy for an ejaculatory control problem.

Step 2: As the man nears climax, he or his partner squeezes the penis just below the glans until the sensation of impending orgasm subsides. Pressure is held until the urge fades and the erection may partly reduce, then stimulation resumes. Repeating this trains the man to delay ejaculation.

Step 3: This makes premature ejaculation the correct indication (option b). Erectile dysfunction (option a) is a problem of achieving an erection, not delaying climax. Retrograde and antegrade ejaculation (options c and d) concern the direction of seminal flow, not its timing, so the squeeze technique does not treat them.

Quick Tip: A behavioural method to delay climax in early ejaculation.

231. A patient with a history of a road traffic accident 2 months ago presents with dreams of accidents. He is able to visualize the same scene whenever he visits the place and is afraid to go back to the accident site. Identify the type of disorder he might be suffering from.

- (A) Adjustment disorder
- (B) PTSD
- (C) Anxiety disorder
- (D) OCD

Correct Answer: (B) PTSD

Solution:

Step 1: The patient had a significant traumatic event (a road traffic accident) and now, weeks later, has intrusive recollections - nightmares of accidents and vivid re-experiencing of the scene when near the site. This points to post-traumatic stress disorder (PTSD).

Step 2: PTSD requires an etiologically significant trauma followed by a triad of features: re-experiencing (nightmares, flashbacks, reliving the event), avoidance of reminders, and hyperarousal. Here the man re-lives the scene and avoids the accident site, fulfilling these criteria.

Step 3: The distractors are weaker. Adjustment disorder is a milder emotional reaction to a stressor without the re-experiencing and flashbacks. Generalised anxiety disorder is free-floating worry not tied to a specific traumatic memory. OCD involves obsessions and compulsions, not trauma re-experiencing. So PTSD (option b) is correct.

Quick Tip: Trauma plus re-experiencing, nightmares and avoidance of the site.

232. Freud's theory of dream includes all of the following except:

- (A) Displacement
- (B) Condensation
- (C) Symbolisation
- (D) Correlation

Correct Answer: (D) Correlation

Solution:

Step 1: Recall the concept. In Freudian psychoanalysis, the dream is a disguised fulfilment of an unconscious wish. The mechanisms by which the latent (hidden) dream content is converted into the manifest (remembered) dream are together called the dream work.

Step 2: List the dream-work mechanisms. The dream work uses condensation (fusing two or more ideas or images into a single element), displacement (shifting emotional importance from the real object onto a less significant one), symbolisation (representing a thought by a symbol), and secondary elaboration (organising the material into a coherent story).

Step 3: Identify the odd one out. Correlation is a statistical concept, not a Freudian dream mechanism. So it is the exception.

Step 4: Why the distractors are wrong. Displacement, condensation, and symbolisation are all genuine components of Freud's dream work, so none of them can be the answer.

Quick Tip: Three are dream-work mechanisms; one is a statistics term.

233. Expression and consequent release of a previously repressed emotion is called:

- (A) Regression
- (B) Dissociation
- (C) Abreaction
- (D) All of the above

Correct Answer: (C) Abreaction

Solution:

Step 1: Define the target term. Abreaction is the expression and resulting discharge of a previously repressed emotion, brought about by reliving the original experience that caused it.

Step 2: How it is achieved. Abreaction is classically produced through techniques such as hypnosis and suggestion, where the buried memory is brought to the surface and the bottled-up feeling is released.

Step 3: Why the distractors are wrong. Regression is a defence mechanism of returning to an earlier developmental stage. Dissociation is a splitting of mental processes from conscious awareness. Neither describes the release of a repressed emotion, so option D is also incorrect.

Quick Tip: Reliving a memory to discharge a buried feeling, often via hypnosis.

234. All of the following are habit disorders except:

- (A) Nail biting
- (B) Thumb sucking
- (C) Temper tantrum
- (D) Tics

Correct Answer: (C) Temper tantrum

Solution:

Step 1: Define habit disorder. A habit disorder is a group of related conditions marked by repetitive, fairly stable behaviour that occurs largely outside the person's awareness.

Step 2: List recognised habit disorders. This umbrella includes tic disorders, body-focused repetitive behaviours such as trichotillomania (hair pulling), skin picking, nail biting, and rhythmic repetitive patterns like thumb sucking, head banging, body rocking, and teeth grinding.

Step 3: Identify the exception. A temper tantrum is an emotional outburst of frustration or anger, not a repetitive automatic habit. So it is not a habit disorder.

Step 4: Why the others are habit disorders. Nail biting and thumb sucking are classic self-soothing repetitive behaviours, and tics are sudden recurrent non-rhythmic movements or sounds, all of which fit the habit-disorder definition.

Quick Tip: One option is an emotional outburst, not a repetitive automatic behaviour.



235. The new name for mental retardation, according to the American Association on Mental Retardation, is:

- (A) Feeble mindedness
- (B) Madness
- (C) Intellectual disability
- (D) Mentally unstable

Correct Answer: (C) Intellectual disability

Solution:

Step 1: Recall the terminology change. The condition formerly called mental retardation has been renamed intellectual disability, also termed general learning disability.

Step 2: Define the condition. Intellectual disability is a generalized neurodevelopmental disorder characterised by significantly impaired intellectual functioning together with impaired adaptive functioning, beginning in the developmental period.

Step 3: Why the distractors are wrong. Feeble mindedness, madness, and mentally unstable are outdated, non-specific, or pejorative terms that are not the accepted modern designation.

Quick Tip: The modern, respectful replacement for the old term.

236. Nowadays, Down syndrome is referred to as:

- (A) Submental disorder
- (B) Oligophrenia
- (C) Madness
- (D) Mentally unstable

Correct Answer: (B) Oligophrenia

Solution:

Step 1: Background. Down syndrome, or trisomy 21, is a genetic disorder caused by an extra copy of all or part of chromosome 21, associated with characteristic facial features, growth delay, and mild to moderate intellectual disability.

Step 2: The terminology asked. The historical term applied to Down syndrome and similar intellectual-disability conditions is oligophrenia, meaning poverty of mind. The older eponym was mongolism, which has been abandoned.

Step 3: Why the printed key is corrected. The printed answer of submental disorder is not a recognised synonym for Down syndrome and is medically incorrect. The accepted alternative term is oligophrenia.

Step 4: Why the others are wrong. Madness and mentally unstable are vague, non-diagnostic lay terms and do not denote Down syndrome.

Quick Tip: An old Greek-derived term meaning poverty of mind.

237. A 55-year-old chronic alcoholic man presents with irrelevant talk, tremor, and sweating. He had his last drink 3 days ago. What is the probable diagnosis?

- (A) Delirium tremens
- (B) Korsakoff psychosis
- (C) Post-acute withdrawal syndrome
- (D) Discontinuation syndrome

Correct Answer: (A) Delirium tremens

Solution:

Step 1: Read the clues. A chronic alcoholic who stopped drinking about 3 days ago now has confusion (irrelevant talk), tremor, and sweating. This timing and symptom cluster points to severe alcohol withdrawal.

Step 2: Name the syndrome. Delirium tremens, also called alcohol withdrawal delirium, is the most severe form of ethanol withdrawal. It features altered mental status (global confusion) and autonomic hyperactivity (sweating, tachycardia, tremor), and classically peaks around 48 to 96 hours after the last drink.

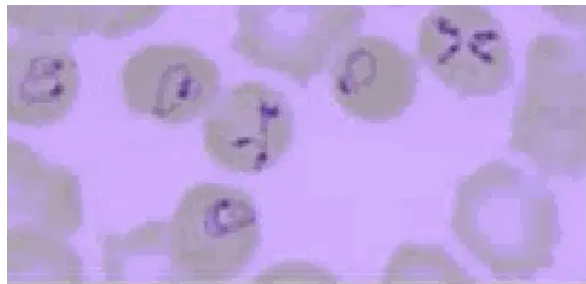
Step 3: Mechanism. Chronic alcohol enhances inhibitory GABA activity and blocks excitatory NMDA receptors. On withdrawal, GABA inhibition falls and NMDA-mediated excitation rises, producing tremor, diaphoresis, tachycardia, anxiety, and in severe cases seizures.

Step 4: Why the distractors are wrong. Korsakoff psychosis is a chronic amnestic state from thiamine deficiency, not acute confusion with autonomic surge. Post-

acute withdrawal and discontinuation syndromes are milder and not characterised by acute delirium.

Quick Tip: Confusion plus autonomic storm peaking 2-4 days after the last drink.

238.



Which of the following is the carrying agent (vector) for the disease showing the given characteristic appearance on microscopy?

- (A) Anopheles
- (B) Ixodes scapularis tick
- (C) Louse
- (D) Rat flea

Correct Answer: (B) Ixodes scapularis tick

Solution:

Step 1: Identify the finding. The image shows the Maltese cross, a tetrad of four parasites inside a red blood cell with their pointed ends meeting at the centre. This is pathognomonic of babesiosis.

Step 2: Link disease to vector. Babesiosis is an intraerythrocytic infection transmitted by the Ixodes scapularis tick, the same tick that transmits Lyme disease.

Step 3: Distinguish from malaria. Babesiosis can mimic Plasmodium falciparum malaria but is told apart by the presence of the Maltese cross (absent in malaria) and the absence of the pigment hemozoin (present in malaria).

Step 4: Why the distractors are wrong. Anopheles transmits malaria, the louse transmits epidemic typhus and relapsing fever, and the rat flea transmits plague, none of which produce the Maltese cross.

Quick Tip: Maltese cross in RBCs means babesiosis; recall its hard-tick vector.



239. Which of the following is the best stent material for a femoropopliteal bypass intervention?

- (A) Dacron
- (B) Reversed saphenous vein
- (C) PTFE
- (D) None

Correct Answer: (C) PTFE

Solution:

Step 1: Understand the setting. The femoropopliteal segment is highly mobile, so a stent used here must flex without fracturing while resisting restenosis.

Step 2: Choose the material. PTFE (polytetrafluoroethylene)-covered self-expanding nitinol stents are preferred in femoropopliteal interventions. PTFE-covered stents are engineered with a 30 to 100 micron pore size that allows endothelial lining of the stent-graft and vessel healing.

Step 3: Why self-expanding nitinol. Only self-expanding covered nitinol stents should be used in this segment, because their flexibility tolerates the bending and compression forces around the knee.

Step 4: Why the distractors are wrong. Dacron is used for larger central grafts, not flexible femoropopliteal stents. Reversed saphenous vein is a bypass conduit graft, not a stent. So PTFE is the best answer.

Quick Tip: Think covered self-expanding nitinol with a microporous polymer cover.



240. Trilene (trichloroethylene) is degraded by:

- (A) Enzymatic degradation
- (B) Non-enzymatic degradation
- (C) Chemical degradation
- (D) None

Correct Answer: (A) Enzymatic degradation

Solution:

Step 1: Recall the agent. Trilene (trichloroethylene) is an inhalational agent that is a good analgesic, less depressant, and non-flammable, but it can cause cardiac dysrhythmias and tachypnoea.

Step 2: Note its caution. It must not be used in a closed circuit because it reacts with soda-lime to produce the toxic gas phosgene, and it should not be combined with adrenaline infiltration.

Step 3: Mechanism of degradation. Trichloroethylene is broken down by enzymatic degradation. The enzyme toluene 1,2-dioxygenase initiates one branch of the metabolic pathway.

Step 4: Conclude. Because the breakdown is driven by enzymes, the correct option is enzymatic degradation, making the non-enzymatic and chemical options incorrect.

Quick Tip: A dioxygenase enzyme starts the breakdown pathway.

241. The earliest feature of third cranial nerve involvement in a patient with diabetes mellitus is:

- (A) Normal light reflex
- (B) Abnormal light reflex
- (C) Normal light and accommodation reflex
- (D) Abnormal light and accommodation reflex

Correct Answer: (A) Normal light reflex

Solution:

Step 1: Recall the nerve anatomy. The oculomotor nerve (third cranial nerve) supplies most extraocular muscles, raises the eyelid, and also carries parasympathetic fibres that drive pupillary constriction and accommodation.

Step 2: Understand pupil-sparing palsy. The parasympathetic pupillary fibres run on the outer surface of the nerve and get their blood supply from the surface vessels. In diabetes, the damage is ischaemic and affects the inner core of the nerve while sparing these peripheral pupillary fibres.

Step 3: Apply to the earliest sign. Because the pupillary fibres are spared early, the light reflex remains normal at the onset of a diabetic third-nerve palsy. Patients older than 50 with diabetes typically develop this pupil-sparing oculomotor palsy.

Step 4: Why the distractors are wrong. An abnormal light reflex would point to a compressive cause such as an aneurysm, not the ischaemic diabetic palsy, so the options describing abnormal reflexes are incorrect.

Quick Tip: Diabetic third-nerve palsy is classically pupil-sparing.

242. During squint surgery, the anaesthesiologist notices on the monitor that the blood pressure (and heart rate) suddenly drops to a dangerously low level. What is the best immediate management?

- (A) Give atropine
- (B) Increase the level of anaesthesia
- (C) Ask the surgeon to stop the surgery
- (D) Give adrenaline

Correct Answer: (A) Give atropine

Solution:

Step 1: Recognise the reflex. A sudden fall in heart rate and blood pressure during squint (extraocular muscle) surgery is the oculocardiac reflex, triggered by traction on the extraocular muscles or pressure on the globe. The afferent limb is the trigeminal nerve and the efferent limb is the vagus nerve.

Step 2: First step in management. The immediate action is to ask the surgeon to release the traction, which usually aborts the reflex.

Step 3: Drug of choice. If bradycardia persists, the specific treatment is intravenous atropine, an antimuscarinic that blocks the vagal slowing of the heart and restores rate and pressure.

Step 4: Why the printed key is corrected. The printed answer of adrenaline is medically wrong. The classic, definitive drug for the vagally mediated oculocardiac reflex is atropine, not adrenaline. Merely deepening anaesthesia does not treat the reflex.

Quick Tip: Vagal bradycardia from eye-muscle traction needs an antimuscarinic.

243. All of the following belong to the special visceral efferent column except:

- (A) Glossopharyngeal nerve
- (B) Nucleus ambiguus
- (C) Vagus nerve
- (D) Trigeminal nerve

Correct Answer: (B) Nucleus ambiguus

Solution:

Step 1: Define the column. Special visceral efferent (SVE) fibres provide motor supply to the muscles derived from the pharyngeal (branchial) arches.

Step 2: List the SVE nerves. The cranial nerves that carry SVE fibres are the trigeminal (V), facial (VII), glossopharyngeal (IX), vagus (X), and accessory (XI) nerves.

Step 3: Spot the odd one out. The nucleus ambiguus is a brainstem motor nucleus that gives rise to SVE fibres, but the question lists nerves; nucleus ambiguus is a nucleus, not a cranial nerve, so it is the exception in this list framed as the column of nerves.

Step 4: Why the others fit. Trigeminal, glossopharyngeal, and vagus nerves all carry SVE fibres to branchial-arch muscles, so they are not the answer.

Quick Tip: Three options are SVE nerves; one is a brainstem nucleus.

244. Which of the following conditions is NOT caused by parvovirus B19?

- (A) Roseola infantum
- (B) Aplastic anemia in sickle cell disease
- (C) Fetal hydrops
- (D) Erythema infectiosum

Correct Answer: (A) Roseola infantum

Solution:

Step 1: Recall parvovirus B19 targets. Parvovirus B19 infects red cell precursors, so it produces conditions linked to red-cell suppression and rash.

Step 2: List the B19-related diseases. B19 causes aplastic crisis in patients with chronic haemolysis such as sickle cell disease, hydrops fetalis from transplacental infection in the first 20 weeks of pregnancy, and erythema infectiosum (fifth disease) with its slapped-cheek rash.

Step 3: Identify the exception. Roseola infantum (exanthem subitum, sixth disease) is caused by human herpesvirus 6 (and 7), not parvovirus B19. So it is the condition not caused by B19.

Step 4: Why the others are wrong choices. Aplastic anemia in sickle cell disease, fetal hydrops, and erythema infectiosum are all established B19 diseases and therefore cannot be the answer.

Quick Tip: One rash here is a herpesvirus (HHV-6) disease, not a parvovirus one.



245. Which of the following statements is NOT true about the iliolumbar ligament?

- (A) Upper fibres are attached to the iliac crest
- (B) Lower fibres are attached to the base of the sacrum
- (C) It helps maintain lumbosacral joint stability
- (D) Upper attachment is to the transverse process of T12

Correct Answer: (D) Upper attachment is to the transverse process of T12

Solution:

Step 1: Describe the ligament. The iliolumbar ligament is a strong band that runs from the tip of the transverse process of the fifth lumbar vertebra (L5) to the posterior part of the inner lip of the iliac crest.

Step 2: Note its attachments. Its upper band attaches to the iliac crest and its lower band attaches to the base of the sacrum, and its major function is to strengthen and stabilise the lumbosacral joint.

Step 3: Test the statements. Options A, B, and C correctly describe the iliac crest attachment, the sacral attachment, and the stabilising role.

Step 4: Identify the false statement. The ligament arises from the transverse process of L5, not T12. So the statement that the upper attachment is to the transverse process of T12 is false, and is the correct answer.

Quick Tip: This ligament arises from L5, not from a thoracic vertebra.



246. Where is the placement location for an auditory brainstem implant?

- (A) Scala tympani
- (B) Recess of the 4th ventricle
- (C) Internal auditory canal (IAC)
- (D) Back of the ear

Correct Answer: (B) Recess of the 4th ventricle

Solution:

Step 1: Understand the device. An auditory brainstem implant (ABI) restores hearing by directly stimulating the cochlear nucleus, bypassing a damaged or absent cochlear nerve.

Step 2: Recall the indications. ABIs are useful in patients with neurofibromatosis type 2 (NF2) whose cochlear nerves are lost during tumour resection, and in congenitally deaf children with cochlear malformations or cochlear nerve deficiency.

Step 3: Identify the placement. The electrode is positioned in the lateral recess of the fourth ventricle, usually at the time of tumour resection, so that it can stimulate the cochlear nucleus.

Step 4: Why the distractors are wrong. The scala tympani is where a cochlear implant electrode sits, the IAC carries the nerve but is not the ABI target, and behind the ear is where the external processor lies, not the stimulating electrode.

Quick Tip: The ABI must reach the cochlear nucleus in the brainstem.



247. Which condition is associated with congenital adrenal hypoplasia?

- (A) Male pseudohermaphroditism
- (B) Female pseudohermaphroditism
- (C) True pseudohermaphroditism
- (D) Sequential pseudohermaphroditism

Correct Answer: (A) Male pseudohermaphroditism

Solution:

Step 1: Define the disorder. X-linked congenital adrenal hypoplasia (AHC) is a rare developmental disorder of the adrenal cortex caused by deletion or mutation of the DAX-1 gene.

Step 2: Role of DAX1. DAX1 is necessary for differentiation of the definitive adult adrenal cortex and is also important for normal development of the gonadal axis.

Step 3: Link to the genital phenotype. Disruption of this gene leads to inadequate androgen secretion or inappropriate androgen action, which produces male pseudohermaphroditism, a genetically male individual with under-virilised genitalia.

Step 4: Why the distractors are wrong. Female pseudohermaphroditism is

typically due to congenital adrenal hyperplasia, not hypoplasia. True and sequential pseudohermaphroditism are not the recognised associations of AHC.

Quick Tip: DAX-1 loss means deficient androgens in a genetic male.



248. Which of the following is true regarding ataxia telangiectasia?

- (A) Increase in AFP (alpha-fetoprotein)
- (B) Increases the risk of squamous cell carcinoma
- (C) Autosomal dominant
- (D) None of the above

Correct Answer: (A) Increase in AFP (alpha-fetoprotein)

Solution:

Step 1: Define the disease. Ataxia-telangiectasia (Louis-Bar syndrome) is a rare neurodegenerative, autosomal recessive disorder. Ataxia refers to poor coordination and telangiectasia refers to small dilated blood vessels.

Step 2: Recall the key laboratory finding. A characteristic feature is an increase in serum alpha-fetoprotein (AFP), which makes option A true.

Step 3: Other features. It affects the cerebellum (movement difficulty), the immune system (recurrent infections), and the DNA repair system, leading to an increased incidence of lymphoma and leukaemia, along with oculomotor apraxia and dysarthria.

Step 4: Why the distractors are wrong. The cancer risk is for lymphoma and leukaemia, not squamous cell carcinoma, and the inheritance is autosomal recessive, not dominant, so those two statements are false.

Quick Tip: Look for the classic raised tumour-marker, and note it is recessive.

249. A diabetic patient develops hypopyon 2 days after cataract surgery. What is the management?

- (A) Intravitreal antibiotics
- (B) Eye drops
- (C) Surgery
- (D) No treatment required

Correct Answer: (A) Intravitreal antibiotics

Solution:

Step 1: Recognise the diagnosis. Hypopyon (a layer of pus in the anterior chamber) appearing a couple of days after cataract surgery indicates acute postoperative endophthalmitis, an intraocular infection that is a surgical emergency. Diabetics are at higher risk.

Step 2: Principle of treatment. The infection lies inside the vitreous cavity, so the antibiotic must reach that compartment in high concentration.

Step 3: Choose the management. The standard immediate treatment is intravitreal antibiotics (for example vancomycin plus ceftazidime), often with a vitreous tap for culture. This is option A.

Step 4: Why the distractors are wrong. Topical eye drops cannot achieve adequate intravitreal levels, doing nothing risks rapid loss of the eye, and major surgery (vitrectomy) is reserved for severe cases, not the first-line immediate step.

Quick Tip: Post-op hypopyon means endophthalmitis; the drug must reach the vitreous.

250. According to the ISNT rule, what is the thinnest part of the neuro-retinal rim?

- (A) Inferior
- (B) Superficial
- (C) Temporal
- (D) Medial

Correct Answer: (C) Temporal

Solution:

Step 1: Recall the ISNT rule. The ISNT rule describes the normal pattern of neuro-retinal rim thickness around the optic disc, going from thickest to thinnest as Inferior, Superior, Nasal, Temporal.

Step 2: Apply it to the question. Since the order ends with Temporal, the neuro-retinal rim is normally thickest inferiorly and thinnest temporally.

Step 3: Clinical relevance. In glaucoma this pattern is lost, with vertical thinning and atrophy along the inferior and superior rims, so the ISNT rule is broken.

Step 4: Why the distractors are wrong. Inferior is the thickest, not the thinnest. Superficial and medial are not part of the ISNT sequence, so they are incorrect.

Quick Tip: ISNT goes thickest to thinnest; the last letter is the answer.

251. Leiden thrombophilia is caused by a mutational abnormality of which of the following factors?

- (A) Factor V
- (B) Factor VII
- (C) Factor IX
- (D) Factor X

Correct Answer: (A) Factor V

Solution:

Step 1: Identify the condition. Factor V Leiden thrombophilia is an inherited disorder of blood clotting and is the most common inherited form of thrombophilia.

Step 2: Define the mutation. Factor V Leiden is a specific point mutation in the gene for clotting Factor V.

Step 3: Explain the effect. The mutated Factor V resists inactivation by activated protein C, so clotting is no longer switched off properly, producing an increased tendency to form abnormal clots (thrombophilia).

Step 4: Why the distractors are wrong. Factors VII, IX, and X are not the basis of Leiden thrombophilia; the very name of the condition points to Factor V.

Quick Tip: The condition's own name reveals the clotting factor.



252. Anteversion of the uterus is maintained by which ligament?

- (A) Cardinal ligament
- (B) Uterosacral ligament
- (C) Pubocervical ligament
- (D) Round ligament

Correct Answer: (D) Round ligament

Solution:

Step 1: Recall normal uterine position. In most women the uterus is anteverted and anteflexed, meaning the fundus is tipped forward over the bladder at the cervix-vagina junction.

Step 2: Identify the maintaining ligament. The round ligament of the uterus is

responsible for maintaining anteversion, pulling the fundus forward, a role that is especially relevant during pregnancy.

Step 3: Distinguish the cardinal ligament. The cardinal ligament supports the uterine angle and provides the main lateral support to the cervix, but it is not what keeps the uterus anteverted.

Step 4: Why the other distractors are wrong. The uterosacral ligament pulls the cervix backward and the pubocervical ligament supports it anteriorly toward the pubis, so neither maintains anteversion. The round ligament is the answer.

Quick Tip: The ligament running to the labia majora pulls the fundus forward.

253. Long standing pelvic inflammation may lead to which of the following conditions?

- (A) Pyometra
- (B) Uterine polyposis
- (C) Pseudopregnancy
- (D) Cystic endometrial hyperplasia

Correct Answer: (A) Pyometra

Solution:

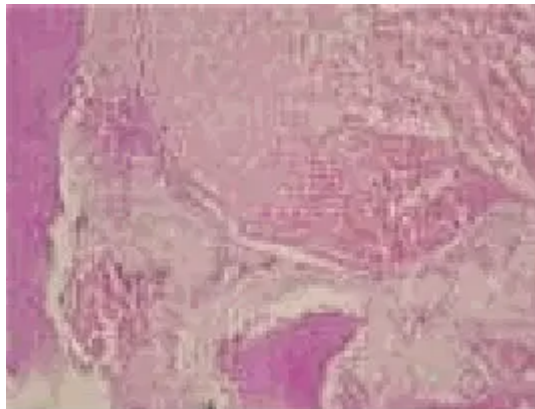
Step 1: Define the condition. Pyometra is a collection of pus within the uterine cavity that forms when the natural outflow of secretions is blocked.

Step 2: Link it to the stem. Long standing pelvic inflammatory disease (PID) causes scarring and stenosis of the cervical canal. With the outlet blocked, infected material and pus accumulate inside the uterus, producing pyometra. Cervical stenosis from any cause (senile atrophy, prior surgery, malignancy) can do the same.

Step 3: Reject the distractors. Uterine polypsis and cystic endometrial hyperplasia are estrogen-driven proliferative changes, not consequences of chronic infection and obstruction. Pseudopregnancy is a hormonal or psychological phenomenon and has no link to PID. Hence the correct answer is Pyometra.

Quick Tip: Think of pus trapped behind an obstructed cervix.

254.



A red soft to firm swelling on the sternum, biopsied with the histology shown above. What is the diagnosis?

- (A) Hemangioma
- (B) Osteochondroma
- (C) Osteoid osteoma
- (D) Paget disease

Correct Answer: (A) Hemangioma

Solution:

Step 1: Read the clinical clue. A red, soft to firm swelling suggests a vascular lesion, and the bone involved is the sternum, a flat bone.

Step 2: Match the histology. Intraosseous hemangioma is a slow growing

vascular neoplasm of the medullary cavity. Histology shows hamartomatous vascular channels lined by endothelium, often with admixed fat, smooth muscle, fibrous tissue and thrombi. These lesions are usually asymptomatic but can appear as a palpable mass, especially in the skull and flat bones.

Step 3: Reject the distractors. Osteochondroma is a cartilage-capped bony outgrowth, not vascular. Osteoid osteoma is a small painful lesion with a radiolucent nidus surrounded by reactive bone, classically causing night pain relieved by NSAIDs. Paget disease is a remodeling disorder with mosaic bone, not a discrete red vascular swelling. The combination of a red vascular swelling and vascular histology confirms hemangioma.

Quick Tip: A red bony swelling with vascular channels on histology.



255. What differentiates delirium from dementia?

- (A) Confusion
- (B) Difficulty in communicating
- (C) Hallucination
- (D) Sudden change

Correct Answer: (D) Sudden change

Solution:

Step 1: Define both. Delirium is an acute confusional state with disturbed perception, attention, mood and activity. Dementia is a chronic, gradual decline in memory and intellect over months to years.

Step 2: Find the discriminator. The key separating feature is onset and course. Delirium develops abruptly over days to weeks and represents a sudden change from the person's baseline, whereas dementia creeps in slowly. Inattention is the hallmark of delirium.

Step 3: Reject the distractors. Confusion, difficulty communicating and hallucinations can all occur in both conditions, so none of them distinguishes one from the other. Only the sudden, acute change in mental status points specifically to delirium. Hence the answer is sudden change.

Quick Tip: Compare the speed of onset, not the symptoms themselves.



256. Genital warts are caused by which virus?

- (A) Herpes simplex
- (B) Human papilloma
- (C) Cytomegalovirus
- (D) Varicella zoster

Correct Answer: (B) Human papilloma

Solution:

Step 1: Identify the lesion. Genital warts are soft growths on the genitals and are a sexually transmitted infection that can cause pain, discomfort and itching.

Step 2: Name the cause. They are produced by certain strains of human papillomavirus (HPV), most commonly the low-risk types 6 and 11.

Step 3: Reject the distractors. Herpes simplex causes painful genital ulcers and vesicles, not warts. Cytomegalovirus causes systemic and congenital infection, not anogenital warts. Varicella zoster causes chickenpox and shingles. Therefore the answer is human papillomavirus.

Quick Tip: Think of the virus behind condyloma acuminatum.



257. Which drug regimen is given in a pregnant woman with HIV infection?

- (A) Tenofovir disoproxil fumarate with emtricitabine
- (B) Tenofovir disoproxil fumarate with lamivudine
- (C) Abacavir with lamivudine
- (D) All

Correct Answer: (D) All

Solution:

Step 1: Recall the principle. Antiretroviral therapy in pregnancy uses a two-NRTI backbone combined with a third agent (an integrase inhibitor, NNRTI or boosted protease inhibitor).

Step 2: List the accepted backbones. The preferred dual-NRTI backbones all cross the placenta well and include tenofovir disoproxil fumarate plus emtricitabine, tenofovir disoproxil fumarate plus lamivudine, and abacavir plus lamivudine (the last only if HLA-B5701 negative).

Step 3: Choose the answer. Since all three listed pairs are acceptable backbone regimens, the correct response is all. Options A, B and C are each individually valid, so no single one can be the sole answer.

Quick Tip: All three are valid two-NRTI backbones in pregnancy.

258. Which of the following structures develops from the dorsal mesentery?

- (A) Greater omentum
- (B) Lesser omentum
- (C) Liver
- (D) Diaphragm

Correct Answer: (A) Greater omentum

Solution:

Step 1: Recall the two mesenteries. In the developing foregut region the gut tube is suspended by a dorsal mesentery behind it and a ventral mesentery in front.

Step 2: Trace the dorsal mesentery. The portion attaching to the greater curvature of the stomach is the dorsal mesogastrium, which grows downward and becomes the greater omentum. The part suspending the colon becomes the mesocolon.

Step 3: Reject the distractors. The lesser omentum and the liver both arise from the ventral mesentery, not the dorsal one. The diaphragm forms from the septum transversum, pleuroperitoneal membranes, dorsal mesentery of the esophagus and body wall muscle, but as a whole it is not a derivative of the dorsal mesentery proper. Hence the greater omentum is the correct answer.

Quick Tip: Dorsal mesogastrium of the stomach becomes which apron?

259.



What is the structure seen in the given X-ray below?

- (A) Stent
- (B) Surgical clips
- (C) Foley catheter
- (D) Intravesical wire

Correct Answer: (A) Stent

Solution:

Step 1: Read the radiograph. The plain abdominal X-ray shows a curled radiopaque tube running along the course of the ureter with J-shaped ends.

Step 2: Identify the device. This is a ureteric stent, also called a double-J or retrograde ureteric stent. One curled end sits in the renal pelvis and the other in the bladder, keeping urine flowing from kidney to bladder.

Step 3: Reject the distractors. Surgical clips are small dense metallic markers, not long curled tubes. A Foley catheter sits in the bladder with a balloon, not coursing up the ureter. An intravesical wire would lie within the bladder only. The double-J appearance along the ureter confirms a stent.

Quick Tip: Curled J-shaped tube running along the ureter.



260.



What is the diagnosis based on the following X-ray?

- (A) Uterine Fibroid
- (B) Bladder Carcinoma
- (C) Bladder stone
- (D) Renal Tuberculosis

Correct Answer: (C) Bladder stone

Solution:

Step 1: Read the film. The radiograph shows multiple oval radiopaque densities lying centrally in the pelvis at the expected position of the bladder.

Step 2: Interpret the finding. Bladder calculi are typically round or oval, often laminated, and appear as radiopaque shadows in the pelvic midline on a plain KUB. Calcium and magnesium salt stones are radiopaque, so they are visible here.

Step 3: Reject the distractors. A uterine fibroid only calcifies in a popcorn pattern and lies in the soft tissue, not as discrete oval pelvic stones. Bladder carcinoma is a soft tissue mass and is not radiopaque. Renal tuberculosis produces calcification higher up in the kidney, not central pelvic stones. The multiple oval pelvic radiopacities confirm bladder stones.

Quick Tip: Oval radiopaque shadows centrally in the pelvis.

261. By which method is foreign DNA introduced into a cell by a virus or viral vector?

- (A) Transduction
- (B) Transcription
- (C) Lysogenic conversion
- (D) Transformation

Correct Answer: (A) Transduction

Solution:

Step 1: Define transduction. It is the transfer of foreign DNA into a cell carried by a virus or viral vector, classically the viral movement of DNA from one bacterium to another.

Step 2: Match the stem. The question specifies a virus or viral vector as the delivery agent, which is exactly transduction.

Step 3: Reject the distractors. Transcription is making RNA from a DNA template, not DNA transfer. Lysogenic conversion is the change in phenotype after a prophage integrates, not the act of delivery itself. Transformation is uptake of naked DNA directly from the environment, without a viral carrier. Hence transduction is correct.

Quick Tip: Which transfer uses a phage as the courier?

262. Which one of the following shows allosteric inhibition?

- (A) Malonic acid & succinate
- (B) 2,3 BPG
- (C) Amino acid alanine & pyruvate kinase
- (D) Citrate

Correct Answer: (B) 2,3 BPG

Solution:

Step 1: Define allosteric inhibition. Negative allosteric modulation occurs when a ligand binds a site distinct from the active site and lowers the affinity for the substrate at the other sites.

Step 2: Apply to the options. When 2,3-bisphosphoglycerate (2,3-BPG) binds its allosteric pocket on hemoglobin, it lowers the oxygen affinity of all the subunits, the textbook example of negative allosteric regulation.

Step 3: Reject the distractors. Malonate inhibits succinate dehydrogenase by competing at the active site, so it is competitive, not allosteric. Alanine inhibition of pyruvate kinase and citrate effects are regulatory but here 2,3-BPG is the cleanest classic allosteric inhibitor, so it is the intended answer.

Quick Tip: Which molecule lowers hemoglobin oxygen affinity at a separate site?

263. Which of the following is seen in seropositive rheumatoid arthritis?

- (A) Multiple joints affected
- (B) Symmetrical joint symptoms
- (C) Joint pain and swelling
- (D) All

Correct Answer: (D) All

Solution:

Step 1: Define seropositivity. Seropositive rheumatoid arthritis means rheumatoid factor (and usually anti-CCP) is detectable in the blood.

Step 2: List the features. These patients classically have a symmetrical polyarthritis with pain and swelling in many joints, especially the small joints of the hands and feet, plus morning stiffness, rheumatoid nodules and erosive joint damage.

Step 3: Choose the answer. Multiple joints, symmetry, and joint pain with swelling are all true of seropositive RA, so the inclusive option all is correct. No single option excludes the others.

Quick Tip: Symmetrical, polyarticular, painful and swollen - all true.



264. Which of the following is not seen in the anterior mediastinum?

- (A) Thyroid tumour
- (B) Thymoma
- (C) Lymphoma
- (D) Neurogenic tumor

Correct Answer: (D) Neurogenic tumor

Solution:

Step 1: Locate the anterior mediastinum. It lies anterior to the pericardium and below the thoracic plane and contains the thymus, lymph nodes and any retrosternal extension of the thyroid.

Step 2: List its masses. The classic anterior mediastinal masses are the four Ts: thymoma, teratoma (germ cell tumor), thyroid lesions, and terrible lymphoma. So thymoma, lymphoma and thyroid tumor all belong here.

Step 3: Identify the odd one. Neurogenic tumors arise from nerve tissue and are

the hallmark masses of the posterior mediastinum, not the anterior compartment. Hence the neurogenic tumor is not seen in the anterior mediastinum.

Quick Tip: Remember the four Ts; nerves sit at the back.

265. Struvite stone is caused by which metal?

- (A) Magnesium
- (B) Calcium
- (C) Sodium & potassium
- (D) Both (a) & (b)

Correct Answer: (A) Magnesium

Solution:

Step 1: Recall the composition. Struvite is a crystalline solid made of magnesium ammonium phosphate ($\text{MgNH}_4\text{PO}_4 \cdot 6\text{H}_2\text{O}$), also called a triple phosphate or infection stone.

Step 2: Pick the metal. The metallic ion in the struvite formula is magnesium, so magnesium is the answer.

Step 3: Reject the distractors. Calcium forms oxalate and phosphate stones, not struvite. Sodium and potassium are not the cation in struvite. Therefore neither the calcium nor the combined options apply, and the correct answer is magnesium.

Quick Tip: Triple phosphate equals magnesium ammonium phosphate.

266. Which of the following statements about Graves disease is false?

- (A) Results in hyperthyroidism
- (B) Autoimmune disorder
- (C) Common in male
- (D) Referred as toxic diffuse goitre

Correct Answer: (C) Common in male

Solution:

Step 1: Recall the disease. Graves disease is an autoimmune disorder in which thyrotropin receptor antibodies (TRAb) stimulate the thyroid to overproduce hormone, causing hyperthyroidism. It is classically called toxic diffuse goitre.

Step 2: Test each statement. Results in hyperthyroidism is true, autoimmune disorder is true, and toxic diffuse goitre is the correct synonym, so those are all true.

Step 3: Find the false one. Graves disease is about ten times more common in women than in men and affects younger women. Saying it is common in males is therefore false, which is exactly what the question asks for.

Quick Tip: Graves is far more common in women, not men.

267. Aldosterone synthesis is stimulated by which of the following?

- (A) ACTH
- (B) Hyperkalemia
- (C) Hyponatremia
- (D) Exogenous steroids

Correct Answer: (B) Hyperkalemia

Solution:

Step 1: List the stimuli. Aldosterone (a mineralocorticoid) secretion is driven, in decreasing order of strength, by hyperkalemia, angiotensin II, ACTH and hyponatremia.

Step 2: Pick the strongest. Hyperkalemia is the single most important physiological stimulus and forms the basis for renal regulation of body potassium. A high serum potassium directly stimulates the zona glomerulosa to release aldosterone, which then promotes potassium excretion.

Step 3: Reject the distractors. ACTH only causes a minor diurnal variation and is not a major regulator. Hyponatremia would suppress, not stimulate, aldosterone (hyponatremia is the weak stimulant). Exogenous steroids do not stimulate aldosterone synthesis. Hence hyperkalemia is correct.

Quick Tip: Which electrolyte rise most strongly drives aldosterone?

268. Which of the following is false about Alzheimer's disease?

- (A) One in 10 people age 65 and older has Alzheimer's disease.
- (B) Alzheimer's disease is curable.
- (C) Causes dementia
- (D) All of the above

Correct Answer: (B) Alzheimer's disease is curable.

Solution:

Step 1: Recall the disease. Alzheimer's disease is a progressive neurodegenerative disorder that destroys memory and other mental functions and is the most common cause of dementia.

Step 2: Check each statement. Roughly one in ten people aged 65 and older has Alzheimer's, and it does cause dementia, so those statements are true. Available drugs (cholinesterase inhibitors such as donepezil, rivastigmine and galantamine)

only ease symptoms for a time.

Step 3: Identify the false one. There is currently no cure for Alzheimer's, so the statement that it is curable is false. That is the answer the question seeks.

Quick Tip: Treatments only ease symptoms; there is no cure.

269. Which of the following is true about vitamin K?

- (A) Anticoagulant
- (B) Prolonged use of antimicrobials leads to deficiency
- (C) Dietary allowance is 15-20 mg
- (D) All of the above

Correct Answer: (B) Prolonged use of antimicrobials leads to deficiency

Solution:

Step 1: Recall the role. Vitamin K is a fat-soluble vitamin needed to synthesize clotting factors and prothrombin, so it is procoagulant, not anticoagulant.

Step 2: Test the antibiotic statement. Much of our vitamin K comes from gut bacteria. Prolonged antimicrobial therapy wipes out this gut flora and reduces vitamin K production, so it can lead to deficiency. This statement is true.

Step 3: Reject the distractors. Calling vitamin K an anticoagulant is wrong because it promotes clotting; warfarin opposes it. The dietary allowance figure of 15-20 mg is wrong because the requirement is in micrograms (about 50-120 mcg/day), not milligrams. Hence the only true statement is that prolonged antimicrobial use causes deficiency.

Quick Tip: Gut bacteria make vitamin K; antibiotics reduce it.

270. Which drug needs continuous monitoring of prothrombin time?

- (A) Aspirin
- (B) Lepirudin
- (C) Digoxin
- (D) Coumadin

Correct Answer: (D) Coumadin

Solution:

Step 1: Identify the drug class. Coumadin (warfarin) is a coumarin oral anticoagulant used to prevent and treat thromboembolism after valve replacement, in atrial fibrillation, and in venous thrombosis and pulmonary embolism.

Step 2: Link to the test. Warfarin blocks vitamin-K-dependent clotting factors, prolonging the prothrombin time. Its effect is monitored by the PT, reported as the INR, to keep the patient in the therapeutic range and avoid bleeding or clotting.

Step 3: Reject the distractors. Aspirin is an antiplatelet and is not titrated by PT. Lepirudin is a direct thrombin inhibitor monitored by aPTT, not PT. Digoxin is a cardiac glycoside monitored by drug levels and ECG. Hence Coumadin is the drug needing PT monitoring.

Quick Tip: The vitamin K antagonist is followed by PT or INR.

271. Which of the following are risk factors for cutaneous lymphoma?

- (A) Age
- (B) Gender
- (C) Weakened immune system
- (D) All

Correct Answer: (D) All

Solution:

Step 1: Recall the risk profile. Skin lymphoma has several recognized risk factors that the question lists separately.

Step 2: Verify each. Age matters, with most cases in people in their 50s and 60s. Gender and race play a role, as most types are commoner in men and in African-Americans. A weakened immune system, as in AIDS or after organ transplantation with immunosuppressants, also raises the risk.

Step 3: Choose the answer. Since age, gender and immunosuppression are all valid risk factors, the inclusive option all is correct. No single one excludes the others.

Quick Tip: Older age, male sex and immunosuppression all count.

272. Which is not included in AIDS related complex?

- (A) Ectopic pregnancy
- (B) Recurrent genital candidiasis
- (C) Generalised lymphadenopathy
- (D) Chronic diarrhea

Correct Answer: (A) Ectopic pregnancy

Solution:

Step 1: Define AIDS related complex. ARC is a symptomatic class B stage of HIV in which the weakened immune system allows various opportunistic and constitutional features to appear.

Step 2: List its features. ARC includes long-lasting diarrhea, marked weight loss, prolonged fever, night sweats, recurrent infections including genital candidiasis,

generalized lymphadenopathy, oral hairy leukoplakia and herpes zoster.

Step 3: Identify the odd one. Ectopic pregnancy is an implantation of a pregnancy outside the uterine cavity and has nothing to do with the immune dysfunction of HIV. The other three are recognized ARC features, so ectopic pregnancy is the answer.

Quick Tip: One option is purely obstetric, not immune-related.



273. Which is the treatment of choice for irradiation in chordoma?

- (A) Protons
- (B) Electrons
- (C) Gamma radiation
- (D) 3D-CRT

Correct Answer: (A) Protons

Solution:

Step 1: Recall the tumor. Chordoma is a slow-growing neoplasm arising from notochordal remnants, typically at the clivus (skull base) and in the sacrum along the spine.

Step 2: Note the radiation challenge. Chordomas are relatively radioresistant and need very high doses to control, yet they sit close to vital structures like the brainstem and spinal cord. This demands a highly precise, sharply focused beam.

Step 3: Pick the modality. Proton therapy delivers a high, conformal dose with a sharp dose fall-off (Bragg peak), sparing adjacent critical tissue, so it is preferred (along with carbon ion therapy) over conventional photon methods. Electrons, gamma radiation and 3D-CRT cannot match this precision and tissue sparing, so protons are the answer.

Quick Tip: Bragg-peak charged particles spare the nearby brainstem.

274.



A woman presents with massive pulmonary thromboembolism. The gross appearance of the liver at autopsy is shown. Which of the following statements best characterizes the patient's condition?

- (A) Metastasis from pulmonary embolism
- (B) Angiosarcoma
- (C) Colonic adenocarcinoma with metastasis
- (D) Locally invaded hepatocellular carcinoma

Correct Answer: (C) Colonic adenocarcinoma with metastasis

Solution:

Step 1: The gross specimen shows multiple discrete tumor masses studding the liver, which is the classic picture of metastatic deposits rather than a single primary tumor.

Step 2: The liver is the commonest site of metastasis for tumors that drain first into the portal circulation. The colon and rectum drain through the portal vein, so a colonic adenocarcinoma readily seeds the liver.

Step 3: Metastatic liver disease is found in about 10% to 25% of patients undergoing surgery for primary colorectal cancer, making option 3 the best fit.

Step 4: Angiosarcoma (a primary vascular tumor) and hepatocellular carcinoma (a single locally invasive mass) do not produce this multinodular metastatic pattern, and "metastasis from PE" is not a recognized entity, so they are wrong.

Quick Tip: Which abdominal cancer drains via the portal vein straight to the liver?

275. Which of the following statements is FALSE about the Measles-Rubella (MR) vaccination campaign launched by WHO?

- (A) Children from 9 months to less than 15 years are vaccinated
- (B) Targets congenital rubella syndrome (CRS), responsible for irreversible birth defects
- (C) India has not yet launched this campaign
- (D) Will replace the routine immunization measles vaccine

Correct Answer: (C) India has not yet launched this campaign

Solution:

Step 1: The question asks for the FALSE statement, so we look for the option that is factually incorrect.

Step 2: India, along with ten other WHO South-East Asia Region member countries, resolved to eliminate measles and control rubella and CRS by 2020, and India did launch the MR campaign. Therefore the claim that India has not launched the campaign is false, making option 3 the answer.

Step 3: The other options are true: all children from 9 months to less than 15 years receive a single MR shot during the campaign, the campaign targets measles and CRS, and after the campaign MR vaccine becomes part of routine

immunization, replacing the standalone measles vaccine given at 9 to 12 months and 16 to 24 months.

Quick Tip: Did India actually launch the MR campaign or not?



276. Which of the following is TRUE regarding Hemophilia A?

- (A) Serum levels of factor VIII are decreased
- (B) Deficiency of factor IX
- (C) PT is increased
- (D) PTT is decreased

Correct Answer: (A) Serum levels of factor VIII are decreased

Solution:

Step 1: Hemophilia is an X-linked disorder of coagulation caused by deficiency of a circulating plasma clotting factor.

Step 2: Hemophilia A is specifically caused by deficiency of factor VIII, so its serum (plasma) level is decreased. This makes option 1 correct. Deficiency of factor IX defines hemophilia B, so option 2 is wrong.

Step 3: Factor VIII acts in the intrinsic pathway, which is assessed by PTT. Hence PTT is increased (prolonged), not decreased, ruling out option 4. PT measures the extrinsic pathway and stays normal, so option 3 (PT increased) is also wrong.

Step 4: Typical bleeding manifestations include hemarthroses, hematomas, mucocutaneous bleeding, intracranial bleeding, hematuria, and pseudotumor.

Quick Tip: Hemophilia A maps to which clotting factor?



277. Marked bleeding is seen in which of the following conditions?

- (A) von Willebrand disease
- (B) Haemophilia A
- (C) Haemophilia B
- (D) Acute lymphoblastic leukemia (ALL)

Correct Answer: (D) Acute lymphoblastic leukemia (ALL)

Solution:

Step 1: The question asks which condition is associated with marked, heavy bleeding. Bleeding disorders may be inherited or acquired.

Step 2: Hemophilia A and B cause bleeding due to low clotting factors, and von Willebrand disease is the commonest inherited bleeding disorder, but each individually produces variable bleeding severity.

Step 3: Acute lymphoblastic leukemia (ALL) replaces normal marrow, causing severe thrombocytopenia. The profound drop in platelets produces marked, often life-threatening mucocutaneous and visceral bleeding, so option 4 is the answer in this recall key.

Step 4: Therefore, among the listed choices, ALL is selected as the condition with the most marked bleeding tendency.

Quick Tip: Which condition causes severe thrombocytopenia from marrow failure?

278. Reed-Sternberg cells are found in:

- (A) Hodgkin's disease
- (B) Sickle cell anaemia
- (C) Thalassemia
- (D) Chronic myeloid leukemia (CML)

Correct Answer: (A) Hodgkin's disease

Solution:

Step 1: Reed-Sternberg cells are large cells, usually derived from crippled germinal-center B lymphocytes, that are the diagnostic hallmark of Hodgkin lymphoma.

Step 2: They are multinucleated or have a bilobed nucleus with prominent eosinophilic nucleoli, producing the classic "owl's eye" appearance, and are CD30 and CD15 positive but usually CD20 and CD45 negative.

Step 3: Their presence is required for the diagnosis of Hodgkin lymphoma, and their absence has a very high negative predictive value, so option 1 is correct.

Step 4: Sickle cell anaemia, thalassemia, and CML are unrelated red cell or myeloid disorders that do not contain Reed-Sternberg cells, so options 2, 3, and 4 are wrong.

Quick Tip: Owl-eye giant cells are the hallmark of which lymphoma?

279. A bedridden patient experiences acute chest pain that is worsened by breathing. Which imaging technique would be most helpful?

- (A) USG
- (B) X-ray chest
- (C) Ventilation perfusion scan
- (D) CT scan

Correct Answer: (D) CT scan

Solution:

Step 1: A bedridden patient with sudden pleuritic chest pain (pain worsened by breathing) is a classic presentation of pulmonary embolism (PE), which also

causes sudden dyspnea, tachypnea, cough, and hemoptysis.

Step 2: The gold standard for diagnosing PE has traditionally been pulmonary angiography, but it is invasive and now used less often.

Step 3: CT pulmonary angiography (CT scan) has become the preferred modality because it is non-invasive, widely available, and accurately demonstrates the embolus, so option 4 is the best answer.

Step 4: A chest X-ray and USG are non-specific, and a ventilation-perfusion scan is reserved for patients who cannot undergo CT, so they are less helpful first choices.

Quick Tip: Which non-invasive scan has replaced pulmonary angiography for PE?

280. Chordoma arises from:

- (A) Pharyngeal bursa
- (B) Notochord
- (C) Rathke's pouch
- (D) Luschka's bursa

Correct Answer: (B) Notochord

Solution:

Step 1: Chordoma is a rare, slow-growing neoplasm believed to arise from cellular remnants of the notochord, so option 2 is correct.

Step 2: Because notochordal remnants lie along the axial skeleton, chordomas occur in bone of the skull base and along the spine. The two commonest sites are the clivus cranially and the sacrum at the base of the spine.

Step 3: There are three histological variants: classical (conventional), chondroid,

and dedifferentiated.

Step 4: Rathke's pouch gives rise to craniopharyngioma, not chordoma, so the other options are incorrect.

Quick Tip: Which midline embryonic structure leaves remnants along the spine?



281. What is the effect of progesterone-only pills?

- (A) Completely suppresses ovulation
- (B) Thins the lining of the uterus
- (C) Thickens the cervical mucus
- (D) All of the above

Correct Answer: (D) All of the above

Solution:

Step 1: Progesterone-only pills (POPs), also called progestin-only pills or minipills, contain only synthetic progestin and no estrogen.

Step 2: One mechanism is thickening the cervical mucus at the neck of the womb, which makes it difficult for sperm to penetrate and reach the egg. This supports option 3.

Step 3: POPs also prevent ovulation and make the lining of the uterus thin, which prevents implantation of a fertilized egg. This supports options 1 and 2.

Step 4: Since all three effects occur, option 4 (all of the above) is correct. POPs also do not interfere with breastfeeding and help with premenstrual symptoms and painful periods.

Quick Tip: POPs act on mucus, ovulation, and endometrium together.

282. Which metal results in "saturnine gout" formation?

- (A) Cadmium
- (B) Lead
- (C) Beryllium
- (D) Mercury

Correct Answer: (B) Lead

Solution:

Step 1: Saturnine gout is the rheumatologic entity that occurs as one manifestation of chronic lead toxicity, so option 2 (lead) is correct.

Step 2: The name "saturnine" derives from the alchemical association of lead with the planet Saturn, linking the term directly to lead exposure.

Step 3: Lead interferes with purine metabolism and causes renal insufficiency, reducing uric acid excretion and precipitating gout. Illicitly distilled beverages contaminated with metallic lead are a classic source.

Step 4: Cadmium, beryllium, and mercury cause other toxicities (renal tubular, granulomatous lung disease, and neurological/renal injury respectively) but not saturnine gout, so they are wrong.

Quick Tip: "Saturnine" is the alchemical name linked to which metal?

283. Which drug decreases bone resorption in osteoporosis?

- (A) Teriparatide
- (B) Risedronate
- (C) Cortisone
- (D) Cimetidine

Correct Answer: (B) Risedronate

Solution:

Step 1: Risedronate is an aminobisphosphonate used for the prevention and treatment of osteoporosis, so option 2 is correct.

Step 2: It works by acting on osteoclasts and their precursors, inhibiting bone resorption and reducing bone remodelling, thereby blocking the bone dissolution process.

Step 3: Teriparatide is a recombinant PTH analog that builds bone (anabolic) and improves skeletal microarchitecture; it is used in severe osteoporosis but does not primarily decrease resorption, so option 1 is wrong.

Step 4: Cortisone (a glucocorticoid) actually promotes bone loss and causes osteoporosis, and cimetidine is an H₂ blocker unrelated to bone, so options 3 and 4 are wrong.

Quick Tip: Which option is a bisphosphonate that poisons osteoclasts?

284. Phenylketonuria is due to deficiency of:

- (A) Phenylalanine
- (B) Phenylalanine hydroxylase (PAH)
- (C) Phenylene
- (D) All of these

Correct Answer: (B) Phenylalanine hydroxylase (PAH)

Solution:

Step 1: Phenylketonuria (PKU) is an autosomal recessive metabolic disorder caused by mutations in the gene for the hepatic enzyme phenylalanine hydroxylase (PAH), rendering it nonfunctional. So option 2 is correct.

Step 2: PAH normally converts the amino acid phenylalanine (Phe) into tyrosine (Tyr). When PAH activity is reduced, phenylalanine accumulates in the body.

Step 3: The excess phenylalanine is converted into phenylpyruvate (a phenylketone), which can be detected in the urine and gives the disease its name.

Step 4: Phenylalanine itself is the substrate that builds up, not a deficiency, so option 1 is wrong; "phenylene" is not a relevant compound, so option 3 and the combined option 4 are wrong.

Quick Tip: Which enzyme converts phenylalanine to tyrosine?

285. Regarding the management of intracranial haematoma, which statement is NOT correct?

- (A) MRI is needed to assess haemorrhage
- (B) GCS assessment helps in prognosis
- (C) Haematoma must always be operated
- (D) All of the above

Correct Answer: (C) Haematoma must always be operated

Solution:

Step 1: The question asks for the incorrect statement. Treatment of a haematoma depends on its location, symptoms, and the clinical situation; some need no treatment while others are emergencies.

Step 2: It is false that a haematoma must always be operated. Many small, symptom-free haematomas need no medical or surgical treatment, and superficial ones often resolve with rest, ice, compression, and elevation (RICE). So option 3 is the answer.

Step 3: Imaging such as MRI does help assess haemorrhage, and Glasgow Coma Scale (GCS) assessment helps in prognosis, so options 1 and 2 are correct statements.

Step 4: Since only one statement is wrong, the combined option 4 is not the answer.

Quick Tip: Is surgery mandatory for every haematoma?

286. In the Maastricht classification of donation after cardiac death, what does category (stage) 3 represent?

- (A) Awaiting cardiac arrest
- (B) Brought in dead
- (C) Unsuccessful resuscitation
- (D) Cardiac arrest after brain-stem death

Correct Answer: (A) Awaiting cardiac arrest

Solution:

Step 1: Non-heart-beating (donation after cardiac death) donors are grouped using the Maastricht classification.

Step 2: Category I is "brought in dead," category II is "unsuccessful resuscitation," category III is "awaiting cardiac arrest" (a controlled situation where death is anticipated after planned withdrawal of life-sustaining treatment), and category IV is "cardiac arrest after brain-stem death."

Step 3: Therefore category 3 corresponds to "awaiting cardiac arrest," making option 1 correct.

Step 4: Options 2, 3, and 4 correspond to categories I, II, and IV respectively, so they are incorrect for stage 3.

Quick Tip: Category III is the controlled, planned-withdrawal scenario.

287. What is a cause of cardiogenic shock other than myocardial infarction?

- (A) Acute mitral regurgitation
- (B) Ventricular septal rupture
- (C) Isolated right ventricular shock
- (D) All of the above

Correct Answer: (D) All of the above

Solution:

Step 1: Cardiogenic shock is most frequently caused by left ventricular dysfunction, often following a myocardial infarction, but several other mechanical and right-sided causes exist.

Step 2: Acute mitral valve regurgitation suddenly overloads the left atrium and drops forward output, producing shock, so option 1 is a valid cause.

Step 3: Ventricular septal rupture (defect) shunts blood and impairs systemic output, and isolated right ventricular shock fails to deliver blood to the left heart, so options 2 and 3 are also valid causes.

Step 4: Because all three are recognized non-MI causes of cardiogenic shock (along with tamponade and cardiac rupture), the answer is option 4, all of the above.

Quick Tip: Each mechanical and right-sided cause can produce shock.

288. Nitric oxide acts by increasing:

- (A) BRCA 1
- (B) BRCA 2
- (C) Interleukin
- (D) cGMP

Correct Answer: (D) cGMP

Solution:

Step 1: Nitric oxide (NO) is released from endothelium and diffuses to the surrounding vascular smooth muscle cells.

Step 2: In the smooth muscle, NO activates guanylate cyclase, which increases cyclic guanosine monophosphate (cGMP), a cyclic nucleotide derived from GTP. So option 4 is correct.

Step 3: cGMP acts as a second messenger, much like cyclic AMP, activating intracellular protein kinases that cause smooth muscle relaxation and vasodilation.

Step 4: BRCA1 and BRCA2 are tumor-suppressor genes and interleukins are cytokines; none of them is the second messenger of NO, so options 1, 2, and 3 are wrong.

Quick Tip: NO stimulates guanylate cyclase to make which messenger?

289. Periodic acid-Schiff (PAS) positive macrophages are seen in:

- (A) Whipple's disease
- (B) Crohn's disease
- (C) AIDS
- (D) None of the above

Correct Answer: (A) Whipple's disease

Solution:

Step 1: The traditional laboratory diagnosis of Whipple's disease is based on light microscopy showing diastase-resistant, periodic acid-Schiff (PAS)-positive granules within macrophages in the affected tissue, so option 1 is correct.

Step 2: These PAS-positive macrophages contain the causative organism *Tropheryma whipplei*.

Step 3: A similar PAS-positive picture can be mimicked by *Mycobacterium avium* infection in AIDS, but the distinction is made by acid-fast staining, which is positive for *M. avium* and negative for Whipple's disease. Thus the classic, defining association is Whipple's disease.

Step 4: Crohn's disease does not show this PAS-positive macrophage pattern, so option 2 is wrong, and option 4 is excluded because Whipple's disease is the correct match.

Quick Tip: Foamy PAS-positive macrophages full of *T. whipplei*.

290. A boy presents with multiple non-suppurative osteomyelitis along with sickle cell anaemia. What is the most likely causative organism?

- (A) *Salmonella*
- (B) *S. aureus*
- (C) *H. influenzae*
- (D) *Enterobacter* species

Correct Answer: (A) *Salmonella*

Solution:

Step 1: Osteomyelitis has different common organisms by patient group. In the general population, *Staphylococcus aureus* is the most frequent cause across most age groups.

Step 2: However, in patients with sickle cell disease, *Salmonella* species are characteristically the most common cause of osteomyelitis, so option 1 is correct.

Step 3: The combination of sickle cell anaemia and multiple bone involvement strongly points to *Salmonella* in this scenario.

Step 4: *S. aureus*, *H. influenzae*, and *Enterobacter* are important in other settings (neonates, children, adults) but are not the classic sickle-cell association, so options 2, 3, and 4 are wrong here.

Quick Tip: Sickle cell plus osteomyelitis equals which organism?

291. The term "pathology" refers to:

- (A) Work
- (B) Function
- (C) Details
- (D) Explains

Correct Answer: (A) Work

Solution:

Step 1: Pathology is the medical term that describes the way a disease works, that is, its mechanisms and effects.

Step 2: Etymologically the word combines "patho" (suffering or disease) with "logos," and the recall key links the term to the concept of "work," the way a disease operates. So option 1 is the intended answer.

Step 3: As a science, pathology studies the causes and effects of diseases, especially through laboratory examination of body tissue samples for diagnostic or forensic purposes.

Step 4: "Function," "details," and "explains" do not capture the intended meaning in this recall key, so options 2, 3, and 4 are wrong.

Quick Tip: Pathology = the way a disease works.



292. A 1-year-old child weighing 6 kg has acute gastroenteritis with sunken eyes and a skin pinch that goes back very rapidly (severe dehydration). What is the appropriate IV fluid management?

- (A) RL infusion 120 ml in the first hour followed by 360 ml over the next 5 hours
- (B) RL infusion 180 ml in the first hour followed by 420 ml over the next 5 hours
- (C) RL infusion 180 ml in the first hour followed by 480 ml over the next 5 hours
- (D) RL infusion 240 ml in the first hour followed by 360 ml over the next 5 hours

Correct Answer: (B) RL infusion 180 ml in the first hour followed by 420 ml over the next 5 hours

Solution:

Step 1: Severe dehydration is a medical emergency requiring immediate IV resuscitation with lactated Ringer's (RL) or normal saline.

Step 2: The initial bolus is 20 to 30 mL/kg. For this 6 kg child, 30 mL/kg gives $30 \times 6 = 180$ mL in the first hour.

Step 3: After the bolus, an infusion of 70 mL/kg is given over 5 hours in children younger than 12 months. That is $70 \times 6 = 420$ mL over the next 5 hours.

Step 4: Combining 180 mL in the first hour and 420 mL over 5 hours matches

option 2, which is therefore correct; the other volume combinations do not fit the weight-based formula.

Quick Tip: Bolus 30 mL/kg, then 70 mL/kg over 5 hours for a 6 kg infant.



293. What constitutes the Malpighian layer of the skin?

- (A) Stratum corneum and stratum lucidum
- (B) Stratum corneum and stratum spinosum
- (C) Stratum spinosum and stratum basale
- (D) Stratum basale and stratum granulosum

Correct Answer: (C) Stratum spinosum and stratum basale

Solution:

Step 1: The Malpighian layer of the skin is generally defined as the stratum basale and the stratum spinosum together, taken as a single unit. So option 3 is correct.

Step 2: These are the deeper, metabolically active layers of the epidermis where cell division and early keratinocyte maturation occur.

Step 3: The layer is named after Marcello Malpighi. It is sometimes defined more narrowly as the stratum basale alone or the stratum spinosum alone, but the standard combined definition is basale plus spinosum.

Step 4: The stratum corneum, lucidum, and granulosum are the more superficial layers and are not part of the Malpighian layer, so options 1, 2, and 4 are wrong.

Quick Tip: The two deepest living epidermal layers form it.



294. Regarding gout, which of the following is the underlying metabolic basis?

- (A) Uric acid nephrolithiasis
- (B) Deficiency of the enzyme involved in purine metabolism
- (C) Increase in serum urate concentration
- (D) Renal disease involving the interstitial tissues

Correct Answer: (B) Deficiency of the enzyme involved in purine metabolism

Solution:

Step 1: Gout is a hereditary disorder marked by an increase in serum uric acid due to increased production or decreased excretion of uric acid and urate salts.

Step 2: It is thought to be caused by the lack of an enzyme needed to completely metabolise purines for renal excretion, which is the metabolic basis selected by the recall key (option 2).

Step 3: The resulting hyperuricaemia leads to deposition of monosodium urate crystals in joints, triggering acute inflammatory arthritis.

Step 4: Uric acid nephrolithiasis and interstitial renal disease are complications rather than the primary enzymatic cause, so options 1 and 4 are not the best basis, and option 3 is a consequence rather than the root enzymatic defect.

Quick Tip: Look for the root enzymatic defect, not a complication.

295. Oxygen therapy may NOT be useful (and may be harmful) in:

- (A) Asthma
- (B) Pneumonia
- (C) Subglottic stenosis
- (D) Pulmonary fibrosis

Correct Answer: (D) Pulmonary fibrosis

Solution:

Step 1: Although many protocols say oxygen should not be withheld from any patient, certain situations are known to do harm with oxygen therapy.

Step 2: These include paraquat poisoning, pulmonary fibrosis, and lung damage from bleomycin treatment, where high oxygen tension can worsen oxidative lung injury. So pulmonary fibrosis (option 4) is the answer.

Step 3: In asthma and pneumonia, supplemental oxygen relieves hypoxaemia and is clearly beneficial, and in subglottic stenosis oxygen supports gas exchange while the airway obstruction is addressed.

Step 4: Therefore the condition where oxygen may not be useful, and can be detrimental, is pulmonary fibrosis.

Quick Tip: Oxygen worsens oxidative lung injury states.

296. A newborn baby with a heart rate of less than 60 beats per minute can be resuscitated by all of the following EXCEPT:

- (A) Chest compression
- (B) Oxygen therapy
- (C) Tactile stimulation
- (D) Slapping the back

Correct Answer: (D) Slapping the back

Solution:

Step 1: In a newborn with a heart rate below 60 beats per minute, neonatal resuscitation steps include effective ventilation with oxygen, chest compressions, and gentle tactile stimulation.

Step 2: Chest compression is indicated when the heart rate remains below 60 despite adequate ventilation, so option 1 is appropriate.

Step 3: Oxygen therapy (positive-pressure ventilation) and tactile stimulation (such as rubbing the back or flicking the soles) are standard, accepted measures, so options 2 and 3 are appropriate.

Step 4: Slapping the back is not a recommended resuscitation method in a newborn and can cause harm, so option 4 is the exception and the correct answer.

Quick Tip: Which maneuver is forceful and not recommended in newborns?

297. Mobitz type 2 second-degree AV block is seen in all of the following EXCEPT:

- (A) Hypothyroidism
- (B) Coronary artery disease
- (C) Sarcoidosis
- (D) Cushing syndrome

Correct Answer: (D) Cushing syndrome

Solution:

Step 1: AV block results from delay or failure of conduction through the AV node and the conduction system below it, with degenerative changes such as fibrosis or calcification being the commonest non-ischaemic cause.

Step 2: Recognized causes of Mobitz type 2 second-degree AV block include conduction-system damage from coronary artery disease, valve surgery, myocardial infarction, myocarditis, and infiltrative cardiomyopathies such as sarcoidosis and haemochromatosis. So options 2 and 3 are valid causes.

Step 3: Myxoedema (hypothyroidism), Lyme disease, and neuromuscular diseases are also listed causes, so option 1 is a valid cause.

Step 4: Cushing syndrome is not a recognized cause of Mobitz type 2 AV block, so option 4 is the exception and the correct answer.

Quick Tip: Which endocrine excess is not a known cause of AV block?

298. On what basis can one diagnose acute respiratory distress syndrome (ARDS) in a child?

- (A) Onset within 7 days of a known clinical insult
- (B) Respiratory failure not fully explained by cardiac failure or fluid overload
- (C) Presence of left ventricular dysfunction
- (D) All of the above

Correct Answer: (D) All of the above

Solution:

Step 1: Pediatric ARDS is diagnosed using a combination of timing, oxygenation, imaging, and exclusion criteria rather than a single feature.

Step 2: Onset must be within 7 days of a known clinical insult, which makes option 1 a valid diagnostic criterion.

Step 3: The respiratory failure must not be fully explained by cardiac failure or fluid overload, so the clinician must assess and account for cardiac contributions such as left ventricular dysfunction. This makes options 2 and 3 part of the diagnostic evaluation.

Step 4: Because all the listed elements are part of arriving at the diagnosis, the recall key marks option 4, all of the above, as correct.

Quick Tip: ARDS criteria combine timing, oxygenation, and cardiac exclusion.



299. A 6-year-old boy developed life-threatening shock; his CT scan showed a large amount of ascites, bowel wall thickening, and poor or absent enhancement of a strangulated bowel segment. Surgical exploration revealed gangrenous bowel. Which of the following is TRUE about the bowel anastomosis?

- (A) It should be done in continuous layers as it takes less time
- (B) It should be done with catgut
- (C) It should be done by single-layer seromuscular Lembert sutures
- (D) It should be done by a single layer taking the submucosa

Correct Answer: (C) It should be done by single-layer seromuscular Lembert sutures

Solution:

Step 1: The clinical picture is congenital internal hernia with strangulated, gangrenous small bowel, requiring resection and anastomosis. Transmesenteric hernia is the most common type in older children and neonates.

Step 2: The recommended technique is a single-layer seromuscular Lembert suture anastomosis, so option 3 is correct.

Step 3: The Lembert suture is an inverting suture used in abdominal surgery that can be continuous or interrupted and joins two intestinal segments without entering the lumen.

Step 4: Catgut is not preferred for bowel anastomosis, and the choices describing continuous-for-speed or submucosa-taking single layers do not match the recommended seromuscular Lembert technique, so options 1, 2, and 4 are wrong.

Quick Tip: Inverting suture that does not enter the bowel lumen.

300. In ACLS, which drug can be given following ventricular fibrillation after cardiac arrest, other than epinephrine?

- (A) Amiodarone
- (B) Dopamine
- (C) Adenosine
- (D) Atropine

Correct Answer: (A) Amiodarone

Solution:

Step 1: Ventricular fibrillation (VF) is the most common rhythm immediately after cardiac arrest, with rapid, erratic electrical activity, and is treated with defibrillation plus CPR.

Step 2: Drug therapy in the ACLS shockable-rhythm algorithm uses epinephrine 1 mg every 3 to 5 minutes, plus an antiarrhythmic.

Step 3: The recommended antiarrhythmic is amiodarone (300 mg first dose, then 150 mg as a second dose) or lidocaine as an alternative. So besides epinephrine, amiodarone is given, making option 1 correct.

Step 4: Dopamine is a vasopressor for shock, adenosine is for supraventricular tachycardia, and atropine is for symptomatic bradycardia, so options 2, 3, and 4 are not used for refractory VF.

Quick Tip: Which antiarrhythmic is first-line for refractory VF in ACLS?