INI CET Pathology

Sample Paper – 7

Duration: 14 Minutes **Maximum Marks: 15**

Instructions

- This paper contains **15** Multiple Choice Questions (Single Best Response), modelled on the Pathology content of **INI CET** (Institutes of National Importance Combined Entrance Test) conducted by AIIMS New Delhi.
- The **15-question** length matches the number of Pathology items you actually meet in the real 200-question paper.
- Each correct answer carries **+1 mark**. There is **negative marking of one-third (0.33) mark** for every incorrect answer; unattempted questions carry no penalty.
- Every question has **exactly one best answer**. Choose the single most appropriate option.
- Attempt this practice paper in one timed sitting of about **14 minutes**, the pace the real computer-based test demands.

Cell Injury and Inflammation

Q1. After thrombolysis restores blood flow to an ischaemic segment of myocardium, cell injury can paradoxically worsen. The principal mediator of this reperfusion injury is:

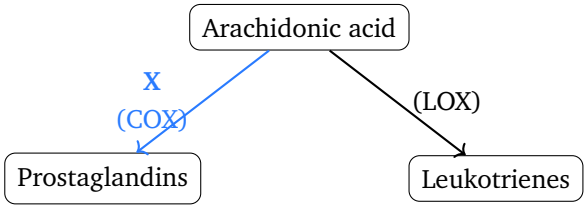
(A) A burst of reactive oxygen species (free radicals)

(B) Depletion of intracellular glycogen stores

(C) Intracellular accumulation of triglyceride

(D) Detachment of ribosomes from the rough endoplasmic reticulum

Q2. In the diagram of arachidonic acid metabolism, the branch marked **X** is catalysed by cyclooxygenase. The mediators produced along this branch are the:



(A) Prostaglandins and thromboxanes

(B) Leukotrienes

(C) Histamine and serotonin

(D) Bradykinin and kinins

Q3. Which of the following factors DELAYS the healing of a surgical wound?

(A) An adequate local arterial blood supply

(B) Bacterial infection of the wound

(C) Sufficient dietary protein intake

(D) Adequate vitamin C for collagen cross-linking

Hemodynamic Disorders

Q4. During labour a woman suddenly develops severe breathlessness, hypotension and seizures, followed within minutes by uncontrolled bleeding from her venepuncture sites (disseminated intravascular coagulation). The most likely diagnosis is:

(A) Pulmonary thromboembolism

(B) Fat embolism

(C) Amniotic fluid embolism

(D) Air embolism

Q5. The diagram contrasts two vascular states: on the left an open arteriole with increased inflow, on the right a vessel whose venous outflow is obstructed. Which statement correctly distinguishes hyperaemia from congestion?

Active arteriolar inflow

Obstructed venous outflow

(A) Hyperaemia is a passive process caused by reduced venous drainage

(B) Hyperaemia is an active process from arteriolar dilatation, whereas congestion is a passive process from impaired venous outflow

(C) Congestion produces a bright red, well-oxygenated tissue

(D) Both hyperaemia and congestion are active, arteriole-driven processes

Neoplasia

Q6. The suffix "-oma" usually denotes a benign tumour, but several tumours are exceptions (misnomers). Which of the following, despite its "-oma" name, is MALIGNANT?

(A) Lipoma

(B) Adenoma

(C) Osteoma

(D) Seminoma

Q7. Which serum tumour marker is most useful in the diagnosis and monitoring of carcinoma of the pancreas?

(A) Prostate-specific antigen (PSA)

(B) CA-125

(C) Beta-human chorionic gonadotropin (beta-hCG)

(D) CA 19-9

Q8. A patient with squamous cell carcinoma of the lung is found to have a raised serum calcium with no bone metastases. This paraneoplastic hypercalcaemia is most often caused by tumour secretion of:

(A) Parathyroid hormone-related peptide (PTHrP)

(B) Calcitonin

(C) Erythropoietin

(D) Antidiuretic hormone (ADH)

Immunopathology

Q9. Amyloid of the AL type, seen in multiple myeloma and other plasma-cell dyscrasias, is derived from:

(A) Serum amyloid-associated (SAA) protein

(B) Immunoglobulin light chains

(C) Beta-2 microglobulin

(D) Transthyretin

Q10. Severe combined immunodeficiency (SCID) is best characterised by:

(A) Absent function of both T and B lymphocytes

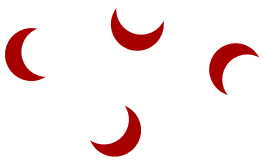
(B) An isolated defect in neutrophil oxidative killing

(C) Deficiency of the C1 esterase inhibitor

(D) A selective deficiency of IgA alone

Hematology

Q11. The peripheral smear shown, with elongated crescent (sickle) shaped red cells, results from polymerisation of an abnormal haemoglobin and causes painful vaso-occlusive crises. The diagnosis is:



sickle (crescent) cells

(A) Hereditary spherocytosis

(B) Beta-thalassaemia major

(C) Sickle cell anaemia

(D) Megaloblastic anaemia

Q12. A child develops petechiae and easy bruising. Investigations show an isolated low platelet count with a normal haemoglobin and white-cell count, and a marrow rich in megakaryocytes. Anti-platelet antibodies are implicated. The most likely diagnosis is:

(A) Aplastic anaemia

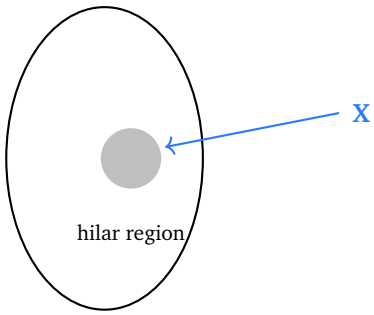
(B) Immune thrombocytopenic purpura

(C) Acute leukaemia

(D) Disseminated intravascular coagulation

Systemic Pathology

Q13. In the diagram of a lung, the tumour marked **X** lies centrally near the hilum, is of neuroendocrine origin, is strongly linked to smoking and spreads early. This carcinoma is the:



(A) Adenocarcinoma

(B) Bronchioloalveolar carcinoma

(C) Large cell carcinoma

(D) Small cell carcinoma

Q14. A young adult has recurrent episodes of visible haematuria within a day or two of each upper respiratory infection. Renal biopsy shows mesangial deposits of IgA. This condition, the commonest primary glomerulonephritis worldwide, is:

(A) Minimal change disease

(B) Membranous nephropathy

(C) IgA nephropathy (Berger disease)

(D) Post-streptococcal glomerulonephritis

Q15. The most common malignant tumour of the kidney in adults, of clear-cell type, arising from proximal tubular epithelium and associated with the von Hippel-Lindau syndrome, is:

(A) Wilms tumour (nephroblastoma)

(B) Transitional cell (urothelial) carcinoma

(C) Renal cell carcinoma

(D) Angiomyolipoma

Detailed Solutions

Q1.

Solution

Concept – reperfusion (free-radical) injury: Restoring oxygen to injured cells can add a second wave of damage.

Step 1 – name the mediator: Returning oxygen fuels a **burst of reactive oxygen species (free radicals)**.

Step 2 – mechanism: These radicals attack membrane lipids, proteins and DNA, worsening the injury already present.

Why the other options are wrong:

- B, glycogen depletion: a feature of ongoing ischaemia, not of reperfusion.
- C, triglyceride accumulation: a reversible fatty change, not the cause of reperfusion injury.
- D, ribosomal detachment: an early reversible change, unrelated to the reperfusion radical burst.

Final Answer: A burst of reactive oxygen species $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q1

Q2.

Solution

Concept – arachidonic acid pathway: Membrane arachidonic acid is metabolised along two enzyme branches.

Step 1 – identify branch X: The **cyclooxygenase (COX)** branch yields **prostaglandins and thromboxanes**.

Step 2 – contrast the other branch: The lipoxygenase (LOX) branch yields leukotrienes.

Why the other options are wrong:

- B, leukotrienes: made by the LOX branch, not the COX branch marked X.
- C, histamine and serotonin: preformed vasoactive amines from mast cells and platelets, not arachidonic acid products.
- D, bradykinin and kinins: products of the plasma kinin system, not of arachidonic acid.

Final Answer: Prostaglandins and thromboxanes ⇒ A

Answer: (A) Go Back to Q2

Q3.

Solution

Concept – factors affecting wound healing: Local and systemic factors can speed or slow repair.

Step 1 – pick the delaying factor: Bacterial infection of the wound delays healing by prolonging inflammation and destroying tissue.

Step 2 – broaden the list: Other delaying factors are poor blood supply, diabetes and steroid therapy.

Why the other options are wrong:

- A, adequate blood supply: promotes healing by delivering oxygen and nutrients.
- C, sufficient protein: supports collagen synthesis and speeds repair.
- D, adequate vitamin C: needed for collagen cross-linking, so it aids healing.

Final Answer: Bacterial infection of the wound ⇒ B

Answer: (B) Go Back to Q3

Q4.

Solution

Concept – obstetric embolism: A sudden collapse in labour with bleeding points to a specific embolism.

Step 1 – name it: Amniotic fluid embolism occurs when amniotic fluid enters the maternal circulation.

Step 2 – why the DIC: Fetal squames and procoagulant fluid trigger disseminated intravascular coagulation and profuse bleeding.

Why the other options are wrong:

- A, pulmonary thromboembolism: causes dyspnoea but not this fulminant DIC-with-seizures picture in labour.
- B, fat embolism: follows long-bone fractures, not delivery.
- D, air embolism: needs entry of air into a vein, an uncommon labour event.

Final Answer: Amniotic fluid embolism ⇒ C

Answer: (C) Go Back to Q4

Q5.

Solution

Concept – hyperaemia versus congestion: Both raise blood volume in a tissue, but by opposite mechanisms.

Step 1 – state the distinction: Hyperaemia is active, from arteriolar dilatation raising inflow; **congestion is passive**, from impaired venous outflow.

Step 2 – colour clue: Hyperaemic tissue is bright red (oxygenated); congested tissue is dusky blue (deoxygenated, cyanotic).

Why the other options are wrong:

- A: reverses the definitions; hyperaemia is active, not passive.
- C: congestion gives a dusky, deoxygenated tissue, not a bright red one.
- D: only hyperaemia is arteriole-driven; congestion is a passive venous process.

Final Answer: Hyperaemia active (arteriolar), congestion passive (venous) ⇒ B

Answer: (B) Go Back to Q5

Q6.

Solution

Concept – tumour nomenclature misnomers: A few malignant tumours keep a benign-sounding "-oma" name.

Step 1 – pick the malignant one: Seminoma is a malignant germ-cell tumour of the testis, despite its name.

Step 2 – other classic misnomers: Lymphoma and melanoma are likewise malignant "-oma" tumours.

Why the other options are wrong:

- A, lipoma: a genuinely benign tumour of fat.
- B, adenoma: a benign glandular tumour.
- C, osteoma: a benign bony tumour.

Final Answer: Seminoma ⇒ D

Answer: (D) Go Back to Q6

Q7.

Solution

Concept – tumour markers: Each marker maps preferentially to one cancer.

Step 1 – match pancreatic carcinoma: CA 19-9 is the marker of choice for carcinoma of the pancreas.

Step 2 – use: It supports diagnosis and tracks response and recurrence.

Why the other options are wrong:

- A, PSA: prostate carcinoma.
- B, CA-125: ovarian carcinoma.
- C, beta-hCG: gestational trophoblastic disease and germ-cell tumours.

Final Answer: CA 19-9 $\Rightarrow$ D

Answer: (D) Go Back to Q7

Q8.

Solution

Concept – paraneoplastic hypercalcaemia: A tumour can raise calcium without bone metastases.

Step 1 – name the mediator: Squamous cell carcinoma of the lung secretes **parathyroid hormone-related peptide (PTHrP)**.

Step 2 – effect: PTHrP mimics parathyroid hormone, driving bone resorption and renal calcium retention.

Why the other options are wrong:

- B, calcitonin: lowers calcium; a marker of medullary thyroid carcinoma.
- C, erythropoietin: causes paraneoplastic polycythaemia (e.g. renal cell carcinoma).
- D, ADH: causes the syndrome of inappropriate ADH with hyponatraemia, not hypercalcaemia.

Final Answer: PTHrP $\Rightarrow$ A

Answer: (A) Go Back to Q8

Q9.

Solution

Concept – amyloid types: The fibril protein defines the amyloid type.

Step 1 – identify AL: AL amyloid is made of **immunoglobulin light chains** from a plasma-cell dyscrasia.

Step 2 – contrast AA: AA amyloid derives from serum amyloid-associated protein in chronic inflammation.

Why the other options are wrong:

- A, SAA protein: the precursor of AA amyloid, not AL.
- C, beta-2 microglobulin: dialysis-associated amyloid.
- D, transthyretin: senile and hereditary (ATTR) amyloid.

Final Answer: Immunoglobulin light chains $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q9

Q10.

Solution

Concept – severe combined immunodeficiency: The word "combined" names the defect.

Step 1 – define it: SCID is the **absent function of both T and B lymphocytes**, crippling cellular and humoral immunity.

Step 2 – clinical clue: Infants present early with severe recurrent infections by bacteria, viruses and fungi.

Why the other options are wrong:

- B, neutrophil killing defect: describes chronic granulomatous disease.
- C, C1 esterase inhibitor deficiency: causes hereditary angioedema.
- D, selective IgA deficiency: a mild, isolated antibody defect, not combined SCID.

Final Answer: Absent T and B cell function $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q10

Q11.

Solution

Concept – red-cell shape: An abnormal haemoglobin can distort the cell.

Step 1 – read the smear: Crescent (sickle) cells indicate **sickle cell anaemia**, from polymerisation of HbS on deoxygenation.

Step 2 – clinical link: Rigid sickled cells block small vessels, causing painful vaso-occlusive crises.

Why the other options are wrong:

- A, hereditary spherocytosis: small round spherocytes, not crescents.
- B, beta-thalassaemia major: microcytic cells with target cells, not sickling.
- D, megaloblastic anaemia: large oval macrocytes, no sickling.

Final Answer: Sickle cell anaemia $\Rightarrow$ $\boxed{\text{C}}$

Answer: (C) Go Back to Q11

Q12.

Solution

Concept – isolated thrombocytopenia: Petechiae with a normal marrow point to platelet destruction.

Step 1 – name it: Immune thrombocytopenic purpura results from anti-platelet antibodies destroying platelets.

Step 2 – confirm the picture: An isolated low platelet count with a marrow rich in megakaryocytes fits peripheral destruction.

Why the other options are wrong:

- A, aplastic anaemia: all cell lines fall, and the marrow is hypocellular.
- C, acute leukaemia: blasts appear and other counts are usually abnormal.
- D, DIC: consumes clotting factors, prolonging clotting times, unlike isolated ITP.

Final Answer: Immune thrombocytopenic purpura $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q12

Q13.

Solution

Concept – lung carcinoma subtypes: Location and cell of origin separate the types.

Step 1 – identify X: A central, hilar, smoking-related tumour of neuroendocrine origin is **small cell carcinoma**.

Step 2 – behaviour: It spreads early and is treated chiefly with chemotherapy, not surgery.

Why the other options are wrong:

- A, adenocarcinoma: typically peripheral and the commonest in non-smokers.
- B, bronchioloalveolar carcinoma: a peripheral non-small-cell pattern.
- C, large cell carcinoma: a non-small-cell tumour lacking neuroendocrine features.

Final Answer: Small cell carcinoma $\Rightarrow$ $\boxed{D}$

Answer: (D) Go Back to Q13

Q14.

Solution

Concept – glomerulonephritis with IgA: Mesangial IgA and post-infective haematuria name the disease.

Step 1 – identify it: IgA nephropathy (Berger disease) shows mesangial IgA deposits and is the commonest primary glomerulonephritis worldwide.

Step 2 – presentation: Visible haematuria appears within a day or two of an upper respiratory infection (synpharyngitic).

Why the other options are wrong:

- A, minimal change disease: nephrotic syndrome in children, no IgA.
- B, membranous nephropathy: subepithelial IgG deposits with nephrotic syndrome.
- D, post-streptococcal GN: follows infection by 1–3 weeks with low complement, not synpharyngitic IgA disease.

Final Answer: IgA nephropathy (Berger disease) $\Rightarrow$ $\boxed{C}$

Answer: (C) Go Back to Q14

Q15.

Solution

Concept – adult renal tumours: Cell type and syndrome link identify the tumour.

Step 1 – name it: Renal cell carcinoma, clear-cell type, arises from proximal tubular epithelium.

Step 2 – syndrome link: It is associated with von Hippel-Lindau syndrome and VHL gene loss.

Why the other options are wrong:

- A, Wilms tumour: a childhood renal tumour, not the adult clear-cell cancer.
- B, transitional cell carcinoma: arises from the urothelium of the renal pelvis, not the cortex.
- D, angiomyolipoma: a benign tumour linked to tuberous sclerosis.

Final Answer: Renal cell carcinoma $\Rightarrow$ C

Answer: (C) Go Back to Q15

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	A	2	A	3	B	4	C	5	B
6	D	7	D	8	A	9	B	10	A
11	C	12	B	13	D	14	C	15	C