

NEET PG Forensic Medicine Sample Paper-7

Duration: 10 Minutes

Maximum Marks: 40

Instructions

- This paper contains **10** Multiple Choice Questions.
- Each correct answer carries **+4** mark. Incorrect answer: **-1** marks. Only **one** correct option.
- Unattempted questions carry **0** marks.
- Use of mobile phones, smartwatches, or any electronic gadgets is strictly prohibited.

- Q1.** A 28-year-old male is brought to the emergency department with severe abdominal pain, persistent vomiting with a metallic taste, and garlic-like odor in his breath. On examination, he is dehydrated and has a bluish-green pigmentation on his gums. Which of the following is the most likely substance responsible for this clinical presentation?
- (A) Lead poisoning
(B) Arsenic poisoning
(C) Mercury poisoning
(D) Phosphorus poisoning
- Q2.** A registered medical practitioner is subpoenaed to attend a Court of Session in a criminal case, and on the same day, receives another subpoena from a Consumer Forum. Which of the following statements correctly guides the practitioner's legal obligation?
- (A) The practitioner can choose to attend either court as long as an excuse letter is sent to the other.
(B) Criminal court takes precedence over civil/consumer court; hence, attending the Court of Session is mandatory.



- (C) The consumer forum takes precedence because it involves patient rights and direct negligence claims.
- (D) The practitioner must pay a fine to the civil court to legally attend the criminal court session.

Q3. Refer to the image provided below showing a specific post-mortem artifact found during an autopsy. Which of the following phenomena is depicted, and what is its primary causative mechanism?



- (A) Rigor mortis, caused by glycogen depletion and ATP degradation in muscles.
 - (B) Post-mortem lividity, caused by gravitational settling of blood in dependent capillaries.
 - (C) Putrefaction, caused by endogenous bacterial action and gas production.
 - (D) Adipocere formation, caused by hydrogenation of body fats in damp environments.
- Q4.** A young female was brought to the mortuary with a history of death due to ingestion of an unknown substance. During autopsy, the forensic pathologist observes that the stomach mucosa is intensely congested, softened, and stained a bright yellow-brown color. The gastric contents emit a highly pungent, suffocating odor. Which toxin is highly suspected?
- (A) Nitric acid
 - (B) Sulfuric acid
 - (C) Hydrochloric acid
 - (D) Carbolic acid



- Q5.** An unknown decomposed body is recovered from a forest. The forensic anthropologist examines the pelvis and notes a deep, narrow greater sciatic notch, an acute subpubic angle ($\angle < 70^\circ$), and a triangular-shaped obturator foramen. What is the most definitive determination regarding the biological identity of this individual?
- (A) The skeletal remains belong to a definitive biological female.
 - (B) The skeletal remains belong to a definitive biological male.
 - (C) The pelvis morphology indicates an adolescent individual under 12 years of age.
 - (D) The features are ambiguous and cannot be used to differentiate biological sex.
- Q6.** A medical practitioner prescribes a drug to a patient in a dose far exceeding the standard therapeutic range without checking the patient's previous prescription records, leading to acute organ failure and subsequent death. Under which section of the Indian Penal Code (IPC) can this doctor be primarily charged for causing death by negligence?
- (A) Section 304A IPC
 - (B) Section 304 IPC
 - (C) Section 338 IPC
 - (D) Section 326 IPC
- Q7.** A patient presents to the emergency department after accidentally consuming a pesticide. The patient exhibits severe miosis, profuse sweating, hyperperistalsis, generalized muscle fasciculations, and bradycardia. Which of the following configurations represents the ideal therapeutic intervention management strategy?
- (A) Immediate administration of Naloxone along with heavy intravenous fluids.
 - (B) Administration of Atropine until signs of atropinization appear, supplemented by Pralidoxime (2-PAM).



- (C) Administration of British Anti-Lewisite (BAL) combined with active gastric lavage.
- (D) Intravenous infusion of Physostigmine to counteract central peripheral neurological manifestations.

Q8. During a homicidal investigation, a blood stain found at the crime scene needs to be definitively identified as human origin rather than animal origin. Which of the following tests should be routinely employed to establish this species-specific determination?

- (A) Kastle-Meyer test
- (B) Teichmann's crystal test
- (C) Precipitin test
- (D) Takayama test

Q9. Refer to the radiological image provided below showcasing the epiphyseal fusion parameters of a long bone joint. Based on the complete fusion of the lower end of the radius and ulna seen here, what is the most scientifically sound estimate of the chronological age of the individual?



- (A) 10 to 12 years
- (B) 13 to 15 years
- (C) 18 to 20 years
- (D) 25 to 28 years

Q10. A victim of an assault is brought to the casualty department. The examining doctor documents a deep laceration over the right parietal scalp measuring 6 cm × 2 cm × bone deep, which requires surgical closure and results in



temporary hospitalization for 22 days due to an inability to perform ordinary daily pursuits. According to the Indian Penal Code, this injury is legally categorized under which category?

- (A) Simple hurt under Section 319 IPC
- (B) Grievous hurt under Section 320 IPC
- (C) Culpable homicide under Section 299 IPC
- (D) Assault with a deadly weapon under Section 324 IPC



Detailed Solutions

Q1.

Solution

Concept: Acute heavy metal and metalloid poisoning presents with distinct clinical signs, such as gastrointestinal irritation, characteristic breath odors, and specific mucocutaneous manifestations. Recognizing the unique constellation of these clinical features is essential for rapid diagnosis in emergency medicine and forensic investigations.

Solution:

- (a) Arsenic poisoning is classic for producing a pronounced garlic-like odor in the breath and vomitus due to the volatile dimethylarsine compound formed during its biotransformation.
- (b) Severe acute ingestion causes significant hemorrhagic gastroenteritis, presenting as intense abdominal pain and persistent projectile vomiting with a characteristic metallic taste.
- (c) Chronic or subacute exposure classically leads to cutaneous changes like hyperpigmentation and arsenical keratosis; a faint bluish-green or slate-grey pigmentation on the oral margins can sometimes occur due to secondary deposition.
- (d) Lead poisoning presents with a distinct bluish-black line on the gums called the Burtonian line, but features a metallic taste without the classic garlic odor or intense bright yellow/green mucosal sloughing.
- (e) Phosphorus ingestion emits a garlic odor and causes luminous vomitus, but does not correlate with the specific gum changes or metallic taste described.

Final Answer: Arsenic poisoning

Answer: (B)

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Q2.

Solution

Concept: The Indian legal system functions on a defined hierarchy of courts. A medical professional, as an expert witness, must understand court priorities when dealing with conflicting judicial orders, specifically regarding criminal proceedings versus civil or consumer disputes.

Solution:

- (a) A subpoena is a formal judicial command compelling attendance at a specified court under a statutory penalty for non-compliance or failure to appear.
- (b) In the judicial hierarchy of India, criminal courts hold higher legal precedence over civil courts, tribunals, and alternative dispute resolution authorities like the Consumer Forum.
- (c) The Court of Session is a higher criminal court. When an individual receives simultaneous subpoenas for the same date and time, the obligation to attend the Court of Session remains paramount.
- (d) The practitioner is legally required to attend the criminal court and must formally inform the Consumer Forum of the scheduling conflict by submitting a copy of the session court's subpoena.
- (e) Neglecting a criminal court subpoena constitutes contempt of court and is punishable, whereas civil tribunals accommodate rescheduling upon receiving legitimate proof of higher court engagement.

Final Answer: Criminal court takes precedence over civil/consumer court; hence, attending the Court of Session is mandatory.

Answer: (B)

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Q3.

Solution

Concept: Post-mortem changes occur in a predictable chronological sequence following somatic death. Differentiating true antemortem trauma, such as bruising, from normal post-mortem artifacts like hypostasis is a crucial requirement in forensic autopsy practice.

Solution:

- (a) Post-mortem lividity, also termed hypostasis or livor mortis, represents the dark purple or reddish discoloration of the skin that develops in the dependent parts of the dead body.
- (b) This phenomenon is caused entirely by the passive, gravitational settling of blood within the uncompressed capillary network after the cessation of systemic circulation.
- (c) Rigor mortis refers to the chemical stiffening of muscles driven by the depletion of adenosine triphosphate (ATP), preventing the dissociation of actin and myosin filaments.
- (d) Putrefaction is a later stage of decomposition mediated by endogenous anaerobic bacteria, leading to tissue liquefaction, green discoloration, and gas evolution.
- (e) Adipocere formation involves the chemical alteration of body fat into a yellowish-white, waxy substance through the hydrogenation of unsaturated fatty acids in wet conditions.

Final Answer: Post-mortem lividity, caused by gravitational settling of blood in dependent capillaries.

Answer: (B)

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Q4.

Solution

Concept: Corrosive acid ingestion produces characteristic macroscopic lesions and color changes in the gastric mucosa due to chemical interaction with tissue proteins, lipids, and hemoglobin, serving as a vital post-mortem diagnostic indicator.

Solution:

- (a) Nitric acid acts as a powerful corrosive and oxidizing agent. Upon contact with living tissue, it undergoes the xanthoproteic reaction, converting proteins into yellow-brown picric acid derivatives.
- (b) This reaction results in a highly characteristic bright yellow or yellowish-brown discoloration and softening of the mucous membranes of the stomach and upper gastrointestinal tract.
- (c) In contrast, sulfuric acid causes intense coagulative necrosis, tissue dehydration, and carbonization, producing a characteristic charred, black, and perforated stomach wall.
- (d) Hydrochloric acid causes a greyish-white or dull white discoloration of the mucosa, along with intense congestion, but lacks the distinct yellowing properties of nitric acid.
- (e) Carbollic acid acts as a local anesthetic and fixative, rendering the gastric lining hard, leached, tough, and greyish-white with a strong, distinctive phenol odor.

Final Answer: Nitric acid

Answer: (A)

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Q5.

Solution

Concept: Forensic anthropology relies on specific morphological variations in skeletal structures to establish biological sex. The pelvis is the most sexually dimorphic structure in the human body due to evolutionary adaptations for childbirth.

Solution:

- (a) The male pelvis is adapted for bipedal locomotion and a heavier muscular build, featuring a deep, narrow greater sciatic notch and an acute subpubic angle generally less than 70 degrees.
- (b) The obturator foramen in a biological male is typically large and oval or triangular, whereas in a biological female, it appears smaller and more circular.
- (c) The female pelvis exhibits a wide, shallow greater sciatic notch, a broad subpubic angle exceeding 80 to 90 degrees, and a rectangular pubic bone to increase pelvic capacity.
- (d) These morphological differences become pronounced after puberty under hormonal influence, allowing a high degree of accuracy when analyzing adult skeletal remains.
- (e) Given the combined presence of a narrow greater sciatic notch, an acute angle, and a triangular obturator foramen, the remains are definitively identified as male.

Final Answer: The skeletal remains belong to a definitive biological male.

Answer: (B)

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Q6.

Solution

Concept: Medical negligence leading to patient fatality falls under specific provisions of criminal law in India. Determining the exact section depends on the degree of rashness or negligence shown by the practitioner.

Solution:

- (a) Section 304A of the Indian Penal Code deals with causing death by negligence, covering acts that are rash or negligent but do not amount to culpable homicide.
- (b) Prescribing a highly toxic or lethal overdose without consulting past medical records demonstrates a gross failure of reasonable care, satisfying the criteria for criminal medical negligence.
- (c) Section 304 IPC pertains to punishment for culpable homicide not amounting to murder, which requires a deliberate intention or explicit knowledge that the act is likely to cause death.
- (d) Section 338 IPC addresses causing grievous hurt by an act endangering the life or personal safety of others, which is inapplicable here since the patient died.
- (e) Section 326 IPC involves voluntarily causing grievous hurt by dangerous weapons or means, requiring a conscious intent to inflict severe bodily harm.

Final Answer: Section 304A IPC

Answer: (A)

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Q7.

Solution

Concept: Organophosphate pesticide poisoning inhibits acetylcholinesterase, leading to an accumulation of acetylcholine at neuromuscular junctions and synapses. This manifests as severe muscarinic and nicotinic overstimulation.

Solution:

- (a) The clinical picture of miosis, sweating, hyperperistalsis, muscle fasciculations, and bradycardia confirms acute organophosphate or carbamate poisoning.
- (b) Atropine is a competitive muscarinic antagonist that must be administered intravenously in escalating doses until full signs of atropinization (such as mydriasis and tachycardia) appear.
- (c) Pralidoxime (2-PAM) is an oxime compound that reactivates the phosphorylated acetylcholinesterase enzyme, specifically reversing the nicotinic manifestations like muscle fasciculations and weakness.
- (d) Naloxone is a specific opioid receptor antagonist used for opioid toxicidromes, which present with miosis and respiratory depression but lack fasciculations or hyperperistalsis.
- (e) Physostigmine is an acetylcholinesterase inhibitor used to treat anticholinergic toxicity; administering it in this scenario would worsen the existing cholinergic crisis.

Final Answer: Administration of Atropine until signs of atropinization appear, supplemented by Pralidoxime (2-PAM).

Answer: (B)

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Q8.

Solution

Concept: Forensic serology follows a structured, multi-step testing protocol to analyze suspected biological stains. Tests are categorized into presumptive tests, confirmatory tests, and species-origin determination tests.

Solution:

- (a) The Precipitin test is an immunological assay based on the antigen-antibody reaction, used to determine if a blood stain is of human or specific animal origin.
- (b) When human blood extract reacts with human antiserum, a visible precipitate line forms, establishing the species origin with high specificity.
- (c) The Kastle-Meyer test is a highly sensitive presumptive screening test for blood that utilizes phenolphthalein to detect peroxidase-like activity in hemoglobin.
- (d) Teichmann's crystal test is a confirmatory microcrystalline test that produces characteristic brown, rhombocyanin crystals of hemin upon heating blood with a reagent.
- (e) The Takayama test is another confirmatory microcrystalline method that yields pink, feathery crystals of pyridine haemochromogen, confirming the presence of blood but not its species.

Final Answer: Precipitin test

Answer: (C)

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Q9.

Solution

Concept: Age estimation from skeletal and radiological markers is based on the predictable chronological sequence of epiphyseal appearance and fusion in the human skeleton during development.

Solution:

- (a) The lower epiphyseal ends of the radius and ulna represent key ossification landmarks used to estimate age in adolescents and young adults.
- (b) In the Indian population, the lower end of the radius and the lower end of the ulna typically undergo complete epiphyseal fusion between 18 and 20 years of age.
- (c) Fusion of these specific sites occurs slightly earlier in females than in males, but the overall range consistently falls within this late adolescent bracket.
- (d) The age group of 13 to 15 years is associated with the fusion of the elbow joint epiphyses, such as the capitellum and radial head.
- (e) Complete fusion at the wrist excludes younger ranges, while older brackets like 25 to 28 years are confirmed by changes in the clavicle or sacral vertebrae.

Final Answer: 18 to 20 years

Answer: (C)

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Q10.

Solution

Concept: The Indian Penal Code distinguishes between types of physical injuries based on severity, duration of incapacitation, and long-term functional impairment to determine appropriate legal charges.

Solution:

- (a) Section 320 of the IPC defines eight specific categories of injuries that qualify as grievous hurt, including permanent disfigurement or fractures.
- (b) The eighth clause of Section 320 states that any hurt which causes the sufferer to be in severe bodily pain, or unable to follow their ordinary pursuits for a period of twenty days, is classified as grievous.
- (c) Since the victim suffered a deep scalp laceration and remained hospitalized, unable to perform daily activities for 22 days, the statutory 20-day threshold was exceeded.
- (d) Section 319 IPC defines simple hurt as causing bodily pain, disease, or infirmity to any person, which applies only when the duration or severity falls below the criteria of Section 320.
- (e) Culpable homicide involves an act committed with the intention or knowledge of causing death, which is not supported by the clinical details provided.

Final Answer: Grievous hurt under Section 320 IPC

Answer: (B)

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Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	B	2	B	3	B	4	A	5	B
6	A	7	B	8	C	9	C	10	B

