

NEET PG Forensic Medicine Sample Paper-2

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 after being assaulted. The examining medical officer records the injuries but intentionally documents a deep laceration as a "simple abrasion" in the medico-legal report after accepting a bribe from the accused. Under which section of the Bharatiya Nyaya Sanhita (BNS), 2023 (corresponding to the historical Indian Penal Code), can this medical practitioner be primarily prosecuted for framing an incorrect document to save a person from punishment?

- (A) Section 197 IPC / Section 248 BNS
- (B) Section 201 IPC / Section 238 BNS
- (C) Section 218 IPC / Section 255 BNS
- (D) Section 193 IPC / Section 229 BNS

Q2. An emergency room physician treats a victim of a road traffic accident. The police officer requests a copy of the medical case sheet for investigation. The doctor refuses to share any details, citing absolute medical confidentiality and patient-doctor privilege, which leads to a critical delay in tracing the offending vehicle. Which of the following legal provisions holds the physician legally bound to furnish information demanded by a public servant during an investigation?



- (A) Section 176 IPC / Section 206 BNS
- (B) Section 191 IPC / Section 227 BNS
- (C) Section 304A IPC / Section 106 BNS
- (D) Section 179 IPC / Section 209 BNS

Q3. A judicial magistrate is conducting an inquiry into a custodial death. The magistrate summons a forensic expert to give oral evidence regarding the autopsy findings. During the trial, the expert is asked to explain the chronological progression of post-mortem artifacts. What is the highest legal authority in an Indian court under which a witness can be compelled to answer a relevant question despite their reluctance?

- (A) Section 132 of the Indian Evidence Act (IEA) / Section 137 of Bharatiya Sakshya Adhinyam (BSA)
- (B) Section 161 of the Code of Criminal Procedure (CrPC) / Section 180 of Bharatiya Nagarik Suraksha Sanhita (BNSS)
- (C) Section 311 of the Code of Criminal Procedure (CrPC) / Section 348 of Bharatiya Nagarik Suraksha Sanhita (BNSS)
- (D) Section 45 of the Indian Evidence Act (IEA) / Section 39 of Bharatiya Sakshya Adhinyam (BSA)

Q4. Identify the plant toxin shown in the image below, which contains toxalbumins (like ricin or similar ribosome-inactivating proteins) and whose seeds are historically used to prepare "suicidal needles" or "sui" for cattle poisoning:



- (A) Ricinus communis



- (B) *Abrus precatorius*
- (C) *Croton tiglium*
- (D) *Datura stramonium*

Q5. A young woman presents with severe abdominal cramps, peripheral neuropathy involving wrist drop, and a distinct clinical sign along her gingival margin: Which specific biochemical alteration is the primary mechanism of toxicity responsible for this presentation?

- (A) Inhibition of ferrochelatase and δ -aminolevulinic acid dehydratase (δ -ALAD)
- (B) Binding to pyruvate dehydrogenase complex causing arsenic-like sulfhydryl depletion
- (C) Inactivation of acetylcholinesterase leading to cholinergic crisis
- (D) Inhibition of cytochrome c oxidase in the mitochondrial respiratory chain

Q6. The image below highlights the post-mortem appearance of a victim's stomach lining following acute poisoning. Note the intense hemorrhagic gastritis, submucosal petechiae, and the classical "velvety appearance" of the mucosa:



Which of the following toxic agents is characteristically responsible for this post-mortem finding?

- (A) Mercury
- (B) Lead
- (C) Arsenic trioxide
- (D) Phosphorus



- Q7.** An agricultural worker is brought to the casualty in an unresponsive state with pin-point pupils, excessive sweating, lacrimation, and involuntary muscle fasciculations. The toxin kinetics can be conceptualized by its action on the synaptic junctions by irreversibly binding to a specific enzyme. Which antidote should be administered immediately to definitively reactivate the inhibited enzyme before it undergoes the phenomenon known as "aging"?
- (A) Atropine sulfate
(B) Pralidoxime (2-PAM)
(C) N-acetylcysteine
(D) Physostigmine
- Q8.** During a skeletal survey of unknown human remains discovered in a shallow grave, a forensic anthropologist computes indices from the pelvic girdle to establish biological sex. Based on the morphological features highlighted in the image below (specifically the sub-pubic angle, width of the greater sciatic notch, and the shape of the pelvic inlet):



What is the most accurate deduction regarding this specimen?

- (A) Definitive Male skeleton
(B) Definitive Female skeleton
(C) Indeterminate sex with mongoloid racial affinity
(D) Pre-pubertal male skeleton
- Q9.** A skull is retrieved from a dried-up riverbed. On examination, the forensic expert observes that the sagittal suture is completely fused internally and



externally, whereas the coronal and lambdoid sutures show complete closure only on the internal table but remain partially open externally. According to the standard patterns of sutural closure for age estimation adapted to Indian population benchmarks, what is the most probable age range of this individual at the time of death?

- (A) 18–22 years
- (B) 25–30 years
- (C) 35–45 years
- (D) Above 65 years

Q10. A dead body is retrieved from an indoor apartment 48 hours after the individual was last seen alive. On external examination, the abdomen appears greenish, and there is a distinct superficial network of dark purplish-red veins visible across the pectoral and shoulder regions, presenting a characteristic marble-like pattern. Which specific biochemical process underlies this classical post-mortem phenomenon?

- (A) Precipitation of reduced hemoglobin within dead capillary beds due to gravitational pooling
- (B) Reaction of hydrogen sulfide produced by anaerobic gut bacteria with altered hemoglobin to form sulfhemoglobin within superficial vessels
- (C) Hemolysis of red blood cells leading to transudation of hematin through the vessel wall into surrounding subcutis
- (D) Dehydration of superficial dermis leading to localized linear parchmenting along vascular trajectories



Detailed Solutions

Q1.

Solution

Concept: The legal framework governing medical practice requires doctors to maintain accurate records. Intentionally framing an incorrect document to shield an offender from legal consequences constitutes a serious offense under Indian law, transitioning from historical IPC provisions to modern BNS statutes.

Solution:

- (a) Section 218 of the Indian Penal Code (IPC) specifically penalizes a public servant or authorized official who shapes or frames an incorrect record or writing with the intent to save a person from punishment or property forfeiture.
- (b) In the updated criminal code framework of India, this specific offense has been transitioned and re-codified under Section 255 of the Bharatiya Nyaya Sanhita (BNS), 2023.
- (c) Section 197 IPC (Section 248 BNS) deals with issuing or signing a false certificate, which is distinct from an official framing a distorted investigative or medico-legal report.
- (d) Section 201 IPC (Section 238 BNS) focuses on causing the disappearance of evidence or giving false information to screen an offender, which applies more broadly rather than specifically to official report distortion.
- (e) Section 193 IPC (Section 229 BNS) prescribes the punishment for giving or fabricating false evidence during a judicial proceeding. Therefore, Section 218 IPC / Section 255 BNS remains the primary and most specific charge for a medical officer falsifying a physical injury description within an official medico-legal report.

Final Answer: Section 218 IPC / Section 255 BNS

Answer: (C)

[Go Back to Question 1](#)



Q2.

Solution

Concept: While medical confidentiality is an essential ethical and legal duty, it is not absolute. Under Indian law, a medical practitioner is legally compelled to disclose vital patient information when legally demanded by a public servant during an ongoing criminal investigation.

Solution:

- (a) Section 179 of the Indian Penal Code (IPC) mandates that any person who is legally bound to state the truth on any subject to a public servant must answer the questions touched upon that subject.
- (b) In the modernized penal code, this statutory requirement corresponds directly to Section 209 of the Bharatiya Nyaya Sanhita (BNS), 2023.
- (c) Refusing to answer or provide critical information demanded by a investigating police officer constitutes an offense under this section, override general confidentiality claims.
- (d) Section 176 IPC (Section 206 BNS) refers to the omission to give notice or information to a public servant by a person legally bound to give it, which is different from refusing to answer direct questions.
- (e) Section 304A IPC (Section 106 BNS) relates to causing death by negligence and is completely irrelevant to the refusal of sharing information. Thus, Section 179 IPC / Section 209 BNS acts as the primary legal driver compelling cooperation in this scenario.

Final Answer: Section 179 IPC / Section 209 BNS

Answer: (D)

[Go Back to Question 2](#)



Q3.

Solution

Concept: The legal machinery relies heavily on expert witness testimony. To ensure justice, courts are empowered with statutory provisions that compel witnesses to answer relevant questions, stripping away standard excuses of civil liability or self-incrimination.

Solution:

- (a) Section 132 of the Indian Evidence Act (IEA) dictates that a witness cannot be excused from answering any relevant question upon the ground that the answer will criminate or expose them to a penalty or forfeiture.
- (b) Under the new legal framework, this historical provision has been integrated into Section 137 of the Bharatiya Sakshya Adhiniyam (BSA).
- (c) This provision ensures that a forensic expert or any witness cannot withhold evidence or refuse to clarify an administrative or post-mortem issue during cross-examination or magistrate inquiries.
- (d) Section 161 CrPC (Section 180 BNSS) covers police examination of witnesses during investigations, not the actual power of a court to compel answers during a formal trial or inquiry.
- (e) Section 311 CrPC (Section 348 BNSS) grants power to the court to summon material witnesses or examine persons present, but the specific legal compulsion to answer an individual question is governed by Section 132 IEA / Section 137 BSA.

Final Answer: Section 132 of the Indian Evidence Act (IEA) / Section 137 of Bharatiya Sakshya Adhiniyam (BSA)

Answer: (A)

[Go Back to Question 3](#)



Q4.

Solution

Concept: Certain plant poisons contain highly toxic glycoproteins called toxalbumins. These molecules act as ribosome-inactivating proteins, halting cellular protein synthesis and causing severe localized or systemic toxic manifestations.

Solution:

- (a) *Abrus precatorius*, commonly known as Jequirity or Ratti, produces bright scarlet red seeds with a distinct black spot at one end, which match the described image parameters.
- (b) The active toxic principle present within these seeds is abrin, a potent toxalbumin structurally resembling ricin but significantly more toxic.
- (c) Historically, these seeds are decorticated, ground up, mixed with water, and shaped into small, sharp fragments called "sui" or suicidal needles, which are used to covertly poison cattle or humans via subcutaneous insertion.
- (d) *Ricinus communis* (Castor) seeds also contain a toxalbumin (ricin) but are larger, mottled brown, and lack the bright scarlet red-and-black dual coloration pattern.
- (e) *Croton tiglium* contains crotin and produces purgative actions, while *Datura stramonium* contains deliriant anticholinergic alkaloids like scopolamine and hyoscyamine, which do not act as ribosomal toxins. Therefore, *Abrus precatorius* is the correct plant identification.

Final Answer: *Abrus precatorius*

Answer: (B)

[Go Back to Question 4](#)



Q5.

Solution

Concept: Heavy metal poisoning often manifests with highly specific clinical signs due to the affinity of metal ions for biological functional groups and enzymes involved in vital biochemical pathways.

Solution:

- (a) Chronic lead poisoning (plumbism) presents with a classic clinical triad consisting of abdominal colic, peripheral neuropathy (motor weakness manifesting as wrist drop or foot drop), and a distinct gingival sign.
- (b) The line along the gums is known as the Burtonian line. It appears as a blue-purplish discoloration caused by the reaction of circulating lead ions with hydrogen sulfide produced by oral bacteria, precipitating lead sulfide.
- (c) Biochemically, lead exerts its toxicity primarily by binding to sulfhydryl groups on essential enzymes involved in heme synthesis.
- (d) It directly inhibits ferrochelatase and delta-aminolevulinic acid dehydratase (delta-ALAD), leading to a buildup of aminolevulinic acid and an operational lack of heme.
- (e) Arsenic primarily binds to the pyruvate dehydrogenase complex; organophosphates inactivate acetylcholinesterase; and cyanide inhibits cytochrome c oxidase. Thus, the inhibition of ferrochelatase and delta-ALAD is the precise mechanism driving lead toxicity.

Final Answer: Inhibition of ferrochelatase and δ -aminolevulinic acid dehydratase (δ -ALAD)

Answer: (A)

[Go Back to Question 5](#)



Q6.

Solution

Concept: The local corrosive and irritant action of certain ingested elemental poisons leaves characteristic morphological signatures on the gastric mucosa during post-mortem visualization.

Solution:

- (a) Ingestion of arsenic trioxide (somakhari) results in severe, acute gastrointestinal irritation. It is traditionally classified as a classic irritant heavy metal poison.
- (b) Upon autopsy, the gastric mucosa displays intense inflammatory congestion, submucosal petechial hemorrhages, and a characteristic appearance described classically as "velvety stomach."
- (c) This velvety texture is caused by extensive submucosal edema coupled with desquamation of the epithelial lining, making the mucosal folds appear plush and dark red.
- (d) Mercury poisoning tends to produce extensive corrosive ulceration and pseudomembrane formation throughout the colon and upper GI tract rather than this classic isolated velvety presentation.
- (e) Phosphorus ingestion gives rise to a "luminous" stomach that smells of garlic and exhibits fatty degeneration, while lead produces mild irritation. Thus, arsenic trioxide is the classic agent behind the velvety hemorrhagic gastritis.

Final Answer: Arsenic trioxide

Answer: (C)

[Go Back to Question 6](#)



Q7.

Solution

Concept: Organophosphate compounds act as irreversible inhibitors of the acetylcholinesterase (AChE) enzyme, leading to an overaccumulation of acetylcholine at nicotinic and muscarinic receptors.

Solution:

- (a) Organophosphates phosphorylate the serine hydroxyl group at the active esteratic site of the acetylcholinesterase enzyme, rendering it non-functional.
- (b) This blockade induces a cholinergic crisis characterized by pin-point pupils, hypersecretion (sweating, lacrimation, salivation), and muscle fasciculations.
- (c) To manage this condition, pralidoxime (2-PAM), an oxime compound, must be administered early to displace the phosphoryl group and reactivate the enzyme.
- (d) If oximes are not administered promptly, the enzyme-poison complex undergoes a chemical process known as "aging," wherein a monomethyl or monoethyl group is lost, making the enzyme inhibition completely permanent.
- (e) Atropine sulfate is a crucial physiologic antidote that blocks muscarinic receptors to control symptoms, but it does not reactivate the enzyme itself. Therefore, pralidoxime is the specific agent needed to reverse the alkylphosphorylation before aging occurs.

Final Answer: Pralidoxime (2-PAM)

Answer: (B)

[Go Back to Question 7](#)



Q8.

Solution

Concept: Forensic anthropology relies on the sexual dimorphism of the human skeleton. The pelvis is the most reliable skeletal component for biological sex identification due to functional adaptations for childbirth in females.

Solution:

- (a) The sub-pubic arch in a definitive human female skeleton is wide, obtuse, and typically measures greater than 90 degrees, forming a smooth U-shape. In males, it is acute and V-shaped (less than 70 degrees).
- (b) The greater sciatic notch is an excellent structural marker; it is wide and shallow in females, typically accommodating an angle of around 75–80 degrees, compared to the deep and narrow male configuration.
- (c) The female pelvic inlet is typically circular or broad-oval, accommodating reproductive requirements, whereas the male inlet is heart-shaped due to a projecting sacral promontory.
- (d) The pubic bone in females is longer and narrower relative to the ischium, which is captured mathematically via a high ischio-pubic index.
- (e) These collective morphological and metric markers allow a forensic pathologist to conclude with over 95 percent accuracy that the skeletal specimen is a definitive female skeleton.

Final Answer: Definitive Female skeleton

Answer: (B)

[Go Back to Question 8](#)



Q9.

Solution

Concept: Ectocranial and endocranial suture closure patterns serve as a standard baseline for estimating the age of an adult human skeleton when dental or epiphyseal parameters are no longer available.

Solution:

- (a) Vault sutures close in a highly structured chronological order, commencing internally (endocranially) before progressing to the outer table (ectocranially).
- (b) The sagittal suture is typically the first of the major vault sutures to begin and complete its closure, starting endocranially around 25 years of age and achieving complete ectocranial fusion by 30 to 35 years.
- (c) The coronal and lambdoid sutures follow next; their internal tables undergo fusion in the late twenties and thirties, but their external portions remain open or only partially fused well into the fourth decade of life.
- (d) Complete internal fusion of all vault sutures with partial ectocranial closure of the coronal and lambdoid sutures corresponds to an age bracket of 35 to 45 years under established Indian forensic benchmarks.
- (e) At 18–22 years, vault sutures remain completely open, while above 65 years, all sutures show complete obliteration both internally and externally. Thus, 35–45 years is the most accurate estimate.

Final Answer: 35–45 years

Answer: (C)

[Go Back to Question 9](#)



Q10.

Solution

Concept: Putrefaction is the final stage of post-mortem decomposition, driven primarily by anaerobic bacterial activity originating from the indigenous intestinal flora.

Solution:

- (a) Following somatic death, the loss of cellular integrity allows gut bacteria, predominantly *Clostridium welchii*, to proliferate rapidly and break down organic compounds.
- (b) These anaerobic bacteria generate large amounts of gases, including hydrogen sulfide (H_2S). The H_2S gas diffuses through the tissues and enters the local venous network.
- (c) Within the superficial blood vessels, hydrogen sulfide reacts directly with hemoglobin and its breakdown derivatives (like methaemoglobin) to produce sulfhemoglobin.
- (d) Sulfhemoglobin possesses a dark greenish-black or purplish color. As it fills the superficial veins, it maps out their anatomical trajectories against the pale skin, a phenomenon termed "marbling."
- (e) This distinctive marble-like pattern typically manifests around 36 to 48 hours post-mortem in temperate climates, appearing earlier across the shoulder and pectoral regions, and signals advanced putrefaction.

Final Answer: Reaction of hydrogen sulfide produced by anaerobic gut bacteria with altered hemoglobin to form sulfhemoglobin within superficial vessels

Answer: (B)

[Go Back to Question 10](#)



Answer Key

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

