

# NEET PG Forensic Medicine Sample Paper-6

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 doctor is summoned to give evidence in a criminal court regarding a case of grievous hurt. Which of the following statements is true regarding a subpoena in India?

- (A) A criminal court subpoena takes precedence over a civil court subpoena if received for the same day.
- (B) It can only be served through an online portal or email.
- (C) Failing to attend after receiving a subpoena is a non-bailable offense under IPC 174.
- (D) A doctor cannot be issued a subpoena by a Judicial Magistrate Second Class.

**Q2.** A 28-year-old female is brought dead to the emergency room with an alleged history of household insecticide ingestion. On inspection, there is marked miosis, excessive salivation, and watery secretions from the nose. Autopsy reveals a characteristic garlic-like odor from the stomach contents. Which of the following is the primary mechanism of action of the suspected toxin?

- (A) Reversible inhibition of monoamine oxidase
- (B) Irreversible inhibition of acetylcholinesterase
- (C) Direct block of voltage-gated sodium channels



(D) Uncoupling of oxidative phosphorylation in mitochondria

- Q3.** During a forensic autopsy of an unidentified skeletal remains, the medical examiner observes the skull features to determine the biological sex. Refer to the image provided below to identify the characteristic marking indicated at the mastoid process.



- (A) Large, blunt mastoid process with a well-developed supramastoid crest, highly suggestive of a male skull.
- (B) Small, pointed mastoid process, highly suggestive of a female skull.
- (C) Smooth occipital protuberance, highly suggestive of a female skull.
- (D) Square chin with a vertical mandible ramus, highly suggestive of a male skull.
- Q4.** A medical practitioner modifies a medical certificate to help a patient claim extra leave from work. Under which section of the Indian Penal Code (IPC) can the doctor be prosecuted for issuing a false medical certificate?
- (A) Section 191 IPC
- (B) Section 197 IPC
- (C) Section 304A IPC
- (D) Section 499 IPC
- Q5.** A patient presents with acute abdominal pain, vomiting, and diarrhea after consuming a homemade tonic. Upon examination, line lines are observed on the gums (Burtonian lines). The toxicology report confirms heavy metal poisoning. What is the antidote of choice for this specific condition?
- (A) Desferrioxamine
- (B) British Anti-Lewisite (BAL) / Dimercaprol



- (C) Atropine sulphate
- (D) N-acetylcysteine

**Q6.** A deceased individual is brought for a medico-legal autopsy. The investigator wants to confirm the exact type of mechanical injury shown in the forensic photograph below. Note the distinct margins and tissue bridging.



- (A) Incised wound with sharp, everted edges.
- (B) Lacerated wound characterized by irregular margins, crushed hair follicles, and visible tissue bridges.
- (C) Chop wound displaying features of both sharp cuts and deep contusions.
- (D) Puncture wound with a clean entry tract and deep internal bruising.

**Q7.** A 45-year-old male was found dead in an agricultural field. His clothes show specific burn patterns, and his skin presents with the characteristic branching cutaneous configuration shown in the reference image. What is the most



likely cause of death?

- (A) High-voltage industrial electrocution
- (B) Flash burns from an accidental gasoline fire
- (C) Lightning strike inducing Lichtenberg figures



(D) Scalding from high-pressure geothermal steam

**Q8.** A young man is brought to the emergency department after ingesting parts of an ornamental plant. He is delirious, dry as a bone, blind as a bat, and red as a beet. The resident suspects *Datura* poisoning. Which pharmacological agent acts as a specific physiological antidote to reverse the central nervous system manifestations?

(A) Neostigmine

(B) Physostigmine

(C) Pralidoxime

(D) Flumazenil

**Q9.** A registered medical practitioner performs an emergency medical termination of pregnancy on a stable 14-week pregnant patient without obtaining a second medical opinion. According to the provisions of the Medical Termination of Pregnancy (MTP) Act of India, this act is:

(A) Fully illegal and punishable, as two opinions are mandatory for all gestations above 12 weeks.

(B) Completely legal, provided it was carried out in good faith to save the life of the pregnant female.

(C) Permissible only if the practitioner possesses a postgraduate degree in Obstetrics and Gynecology.

(D) Subject to a fine but exempt from criminal prosecution if registered with the State Medical Council.

**Q10.** A chronic alcoholic is brought to the hospital presenting with deep coma, hypothermia, and severely depressed respiration. On toxicology screening, methanol poisoning is suspected. Which enzyme is responsible for converting methanol into its highly toxic metabolite, formic acid?

(A) Cytochrome P450 2E1

(B) Alcohol dehydrogenase followed by aldehyde dehydrogenase



- (C) Pseudocholinesterase
- (D) Glucose-6-phosphate dehydrogenase



**Detailed Solutions**

Q1.

**Solution**

**Concept:** A subpoena or summons is a compelling document issued by a court of law directing a witness to attend and give evidence at a specified time and place. In the Indian legal framework, medical professionals frequently receive these orders in medico-legal cases. Understanding the hierarchy, legal obligations, and precedence of different courts is crucial for medical practitioners to avoid contempt of court.

**Solution:**

- (a) When a medical practitioner receives subpoenas from both a criminal court and a civil court requiring attendance on the exact same day, the subpoena issued by the criminal court always takes legal precedence.
- (b) If a doctor receives subpoenas from two courts of equal status (e.g., two criminal courts) scheduled for the same day, the subpoena that was served earlier chronologically must be attended first.
- (c) Non-attendance in response to a valid subpoena without a justified and communicated reason constitutes a bailable offense under Section 174 of the Indian Penal Code, rather than a non-bailable one.
- (d) Any competent criminal court, including a Judicial Magistrate Second Class, possesses the statutory power to issue a subpoena to a witness or medical expert whose testimony is deemed vital to the administration of justice.

**Final Answer:** A criminal court subpoena takes precedence over a civil court subpoena if received for the same day.

**Answer: (A)**[Go Back to Question 1](#)

Q2.

**Solution**

**Concept:** Organophosphorus compound poisoning is a highly prevalent medical emergency in agricultural regions. These compounds are commonly found in commercial and household insecticides. They produce a classic toxidrome characterized by generalized cholinergic overstimulation due to the accumulation of acetylcholine at neuromuscular junctions and autonomic synapses.

**Solution:**

- (a) The ingestion of organophosphates leads to clinical signs including prominent miosis (pinpoint pupils), excessive lacrimation, salivation, rhinorrhea, bronchoconstriction, and gastrointestinal hypermotility, accompanied by a distinct garlic-like odor.
- (b) The primary mechanism of action involves binding to the active site of the acetylcholinesterase enzyme, causing its irreversible inhibition and preventing the breakdown of acetylcholine.
- (c) Accumulation of acetylcholine leads to continuous stimulation of both muscarinic and nicotinic receptors throughout the peripheral and central nervous systems.
- (d) Management requires prompt administration of atropine sulphate to counter muscarinic effects and oximes to reactivate the bound acetylcholinesterase enzyme before aging occurs.

**Final Answer:** Irreversible inhibition of acetylcholinesterase

**Answer: (B)**

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Q3.

**Solution**

**Concept:** Skeletal remains provide vital forensic information during anthropological examinations. Sexual dimorphism in the human skull is highly pronounced and serves as a reliable metric for biological sex determination. The mastoid process, located on the temporal bone, is one of the most reliable landmarks utilized for this morphological differentiation.

**Solution:**

- (a) The male skull generally exhibits robust skeletal traits due to greater muscle mass and mechanical stress during life, resulting in prominent ridges and processes.
- (b) The male mastoid process is characteristically large, blunt, and associated with a well-developed, continuous supramastoid crest that extends past the external auditory meatus.
- (c) In contrast, the female mastoid process tends to be small, pointed, and slender, with a smooth or entirely absent supramastoid crest.
- (d) Other prominent masculine traits of the skull include a pronounced supraorbital ridge, a square chin, a prominent external occipital protuberance, and a vertical mandibular ramus.

**Final Answer:** Large, blunt mastoid process with a well-developed supramastoid crest, highly suggestive of a male skull.

**Answer: (A)**

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Q4.

**Solution**

**Concept:** Medical practitioners hold significant legal and ethical responsibility when issuing official documentation, such as sickness, fitness, or death certificates. Intentionally fabricating or altering medical records to grant undue advantages constitutes a serious legal offense under the Indian Penal Code, attracting strict punitive actions.

**Solution:**

- (a) Section 197 of the Indian Penal Code specifically addresses the issuing or signing of false certificates that are by law receivable as evidence, treating them with the same severity as giving false evidence.
- (b) If a registered medical practitioner knowingly signs or issues a false medical certificate regarding a patient's health status, they can be prosecuted under this specific section.
- (c) Section 191 of the IPC deals generally with giving false evidence under oath, whereas Section 197 explicitly penalizes the act of falsifying certificates.
- (d) Conviction under Section 197 exposes the professional to criminal penalties, which run parallel to disciplinary actions or removal from the medical register by the State Medical Council.

**Final Answer:** Section 197 IPC

**Answer: (B)**

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Q5.

**Solution**

**Concept:** Heavy metal toxicities frequently manifest with multi-system symptoms affecting the gastrointestinal tract, nervous system, and hematological pathways. Chronic or acute-on-chronic exposure to lead can result from contaminated traditional formulations, paints, or industrial environments, requiring targeted chelation therapy.

**Solution:**

- (a) Lead poisoning characteristically presents with severe spasmodic abdominal pain (lead colic), peripheral neuropathy, anemia with basophilic stippling, and a bluish-purple line along the gingival margins known as the Burtonian line.
- (b) Chelation therapy is indicated to facilitate the excretion of lead from soft tissues and bone stores by forming stable, water-soluble complexes.
- (c) British Anti-Lewisite, also known as Dimercaprol, acts as an effective chelating agent by providing sulfhydryl groups that compete with cellular enzymes for binding heavy metals.
- (d) Other chelators commonly deployed based on toxicity severity include Calcium Disodium Edetate, Penicillamine, and Succimer, whereas Desferrioxamine is reserved specifically for iron toxicity.

**Final Answer:** British Anti-Lewisite (BAL) / Dimercaprol

**Answer: (B)**

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Q6.

**Solution**

**Concept:** Distinguishing between different mechanical injuries at autopsy is essential for reconstructing the circumstances surrounding a violent crime. Lacerations and incised wounds can sometimes superficially resemble one another, but distinct structural differences separate them under macro-examination.

**Solution:**

- (a) A lacerated wound is a tearing or splitting of skin tissue caused by the application of blunt force or crushing impacts over bony prominences.
- (b) The defining features of a laceration include irregular, contused margins, intact hair bulbs or follicles crushed within the wound, and the pathognomonic presence of tissue bridging across the margins.
- (c) Tissue bridging consists of intact nerves, blood vessels, and connective tissue fibers that span across the floor of the cleft, which are completely severed in sharp-force incised wounds.
- (d) Recognizing these internal features prevents the forensic pathologist from misclassifying a blunt-force injury as a sharp-weapon injury during a legal inquiry.

**Final Answer:** Lacerated wound characterized by irregular margins, crushed hair follicles, and visible tissue bridges.

**Answer: (B)**

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Q7.

**Solution**

**Concept:** Environmental injuries resulting from natural phenomena present specific morphological signs on skin surfaces. Lightning strikes transfer massive electrical currents and high thermal energy over fractions of a second, producing unique pathognomonic external manifestations on victims.

**Solution:**

- (a) A lightning strike generates a transient, high-voltage surface discharge that tracks along areas of low electrical resistance on the skin, such as sweat pathways.
- (b) This superficial electrical path creates an erythematous, branching, fern-like, or arborescent pattern on the skin known as Lichtenberg figures or filigree burns.
- (c) These branching patterns are not true thermal burns but rather cutaneous extra-vascular red blood cell extravasations caused by the immense electromagnetic shockwave.
- (d) Lichtenberg figures appear within hours of the lightning strike and typically fade away within twenty-four to forty-eight hours if the victim survives the initial cardiac arrest.

**Final Answer:** Lightning strike inducing Lichtenberg figures

**Answer: (B)**

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Q8.

**Solution**

**Concept:** Anticholinergic poisoning commonly stems from accidental or deliberate ingestion of belladonna alkaloids found in *Datura fastuosa* or *Datura stramonium*. The classic presentation involves widespread blockade of postganglionic parasympathetic muscarinic receptors, causing central and peripheral toxidromes.

**Solution:**

- (a) The clinical syndrome includes manifestations such as high fever, dry mucous membranes, flushed skin, dilated pupils, tachycardia, urinary retention, and acute delirium with visual hallucinations.
- (b) Reversing severe central nervous system toxicities, including extreme agitation, seizures, or coma, requires an antidote that effectively crosses the blood-brain barrier.
- (c) Physostigmine is a tertiary amine acetylcholinesterase inhibitor that penetrates the central nervous system to increase synaptic acetylcholine levels, successfully competing with the toxin.
- (d) Neostigmine and pyridostigmine are quaternary amines that carry a positive charge, preventing them from crossing into the central nervous system, making them ineffective for central symptoms.

**Final Answer:** Physostigmine

**Answer: (B)**

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Q9.

**Solution**

**Concept:** The Medical Termination of Pregnancy Act governs the legal criteria, documentation requirements, and consent protocols for performing abortions in India. Successive legislative updates have streamlined the process while preserving essential safety guardrails for maternal health.

**Solution:**

- (a) According to the provisions of the Medical Termination of Pregnancy Amendment Act, a single registered medical practitioner can legally terminate a pregnancy up to twenty weeks of gestation.
- (b) Since the patient in this scenario is at fourteen weeks of gestation and stable, the opinion of only one registered medical practitioner is statutorily required.
- (c) The requirement for opinions from two registered medical practitioners applies specifically to pregnancies ranging between twenty and twenty-four weeks under defined legal categories.
- (d) Therefore, performing the termination at fourteen weeks without a second medical opinion is completely legal, provided all other standard regulatory criteria and consent protocols are satisfied.

**Final Answer:** Completely legal, as only one medical opinion is required for gestations up to twenty weeks.

**Answer: (B)**

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Q10.

**Solution**

**Concept:** Toxic alcohols like methanol pose severe health hazards due to lethal metabolic breakdown products rather than the parent compound itself. The clinical approach focuses on halting metabolic conversion and correcting profound systemic metabolic acidosis.

**Solution:**

- (a) Ingested methanol undergoes rapid hepatic oxidation where the enzyme alcohol dehydrogenase initially metabolizes it into toxic formaldehyde.
- (b) Subsequently, the enzyme aldehyde dehydrogenase rapidly converts formaldehyde into formic acid, which is the primary metabolite responsible for ocular injury and tissue hypoxia.
- (c) Formic acid inhibits mitochondrial cytochrome c oxidase, impairing cellular respiration and causing profound anion gap metabolic acidosis along with retinal damage.
- (d) Treatment utilizes competitive inhibitors of alcohol dehydrogenase, such as fomepizole or ethanol, to block this enzymatic cascade and allow safe clearance of parent methanol.

**Final Answer:** Alcohol dehydrogenase followed by aldehyde dehydrogenase

**Answer: (B)**

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**Answer Key**

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

