# INI CET Forensic Medicine

## Sample Paper – 1

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

### Instructions

- This paper contains **15** Multiple Choice Questions (Single Best Response), modelled on the Forensic Medicine content of **INI CET** (Institutes of National Importance Combined Entrance Test) conducted by AIIMS New Delhi.
- The **15-question** length matches the number of Forensic Medicine 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.

## Thanatology

**Q1.** The permanent stoppage of function of the individual cells and tissues of the body, occurring a few hours after somatic (systemic) death, is termed:

(A) Suspended animation

(B) Molecular (cellular) death

(C) Somatic death

(D) Brainstem death

**Q2.** Brainstem death is best defined as the:

(A) Reversible loss of consciousness with preserved brainstem reflexes

(B) Irreversible cessation of all brainstem functions, including irreversible apnoea

(C) Temporary cessation of the heartbeat with an intact circulation

(D) Isolated flattening of the cortical EEG with normal spontaneous breathing

**Q3.** A state in which the vital functions of the body are depressed to a minimal, clinically imperceptible level so that life appears extinct, yet the person is still alive and can be revived, is called:

(A) Molecular death

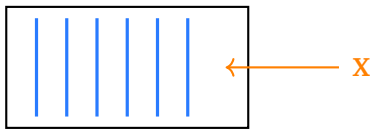
(B) Somatic death

(C) Suspended animation

(D) Brainstem death

## Mechanical Injuries

**Q4.** The abrasion illustrated on the skin faithfully reproduces the shape and pattern of the object that produced it (marked **X**), for example a tyre tread or radiator grille. This type of abrasion is an:



patterned mark on skin

(A) Graze (sliding) abrasion

(B) Pressure abrasion

(C) Imprint (patterned) abrasion

(D) Linear scratch abrasion

**Q5.** The dry, parchment-like abrasion produced by sustained crushing pressure of a ligature against the skin of the neck, reproducing the weave of the ligature, is an example of a:

(A) Graze abrasion

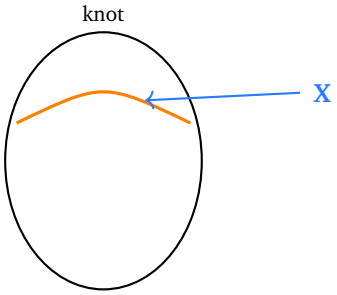
(B) Sliding abrasion

(C) Imprint abrasion caused by a single impact

(D) Pressure abrasion

## Asphyxial Deaths

**Q6.** In the neck diagram of a typical (complete) hanging, the ligature mark (marked **X**) most characteristically:




(A) Runs obliquely, is non-continuous (interrupted at the knot) and lies high on the neck above the thyroid cartilage, directed upward towards the knot

(B) Runs transversely, is continuous all round the neck and lies low, below the thyroid cartilage

(C) Encircles the neck horizontally with uniform depth throughout

(D) Is placed at the root of the neck with an even, unbroken groove

**Q7.** Trickling of saliva from one angle of the mouth running down onto the chin and chest of a hanging victim is an important vital sign indicating that the hanging was antemortem. This finding is known as:

(A) The dribbling of saliva sign

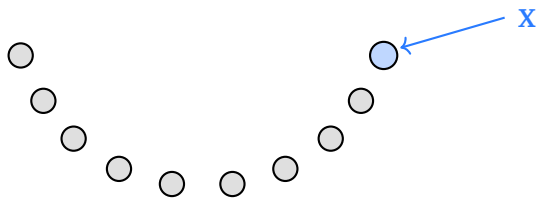
(B) Tardieu spots

(C) Paltauf haemorrhages

(D) Postmortem hypostasis of the face

## Forensic Identification and Medical Jurisprudence

**Q8.** In the diagram of a child's lower dental arch, the first permanent tooth to erupt (marked **X**), appearing at about 6 years of age, is the:




child's lower dental arch

(A) Central incisor

(B) Lateral incisor

(C) First permanent molar

(D) First premolar

**Q9.** Gustafson's method of estimating age from a single ground section of a tooth is based on scoring how many age-related regressive changes?

(A) Three

(B) Four

(C) Five

(D) Six

**Q10.** The second permanent molar tooth normally erupts at approximately what age?

(A) 6 years

(B) 9 years

(C) 12 years

(D) 18 years

## General Toxicology and Corrosive Poisons

**Q11.** In toxicology, the "fatal period" of a poison is defined as the:

(A) Smallest amount of the poison likely to cause death

(B) Time interval between the intake of the poison and death

(C) Largest dose that can be tolerated without causing death

(D) Time taken for the poison to be completely excreted from the body

**Q12.** In a conscious, cooperative adult who has ingested a poison and presents early, the single most useful measure of gastrointestinal decontamination for most adsorbable poisons is:

(A) Forced emesis with syrup of ipecac

(B) Routine gastric lavage performed after 6 hours

(C) Whole-bowel irrigation for every ingested poison

(D) Oral activated charcoal

## Specific Poisons

**Q13.** The specific pharmacological antidote that reactivates the inhibited acetylcholinesterase enzyme in organophosphorus poisoning is:

(A) Pralidoxime (2-PAM)

(B) Atropine

(C) Naloxone

(D) N-acetylcysteine

**Q14.** The muscarinic effects of acute organophosphate poisoning are recalled by the mnemonic DUMBELS. Which of the following is a purely muscarinic feature?

(A) Muscle fasciculations

(B) Excessive salivation and lacrimation

(C) Tachycardia with widely dilated pupils

(D) Flaccid muscle paralysis

**Q15.** Aluminium phosphide (celphos) poisoning liberates phosphine gas on contact with moisture and classically presents with:

(A) A garlicky breath odour with refractory hypotension and severe metabolic acidosis, and no specific antidote

(B) A bitter-almond breath odour with rapid loss of consciousness

(C) Cherry-red discoloration of the skin and mucous membranes

(D) A prompt, complete response to intravenous dimercaprol (BAL)

## Detailed Solutions

**Q1.**

### Solution

**Concept – somatic versus molecular death:** Death is a process, not a single instant, and it can be graded.

**Step 1 – define somatic death:** Somatic (systemic) death is the permanent stoppage of the functions of the brain, heart and lungs, so the person is clinically dead.

**Step 2 – define molecular death:** For a few hours after somatic death individual cells and tissues keep living; their permanent stoppage of function is called **molecular (cellular) death**, and it proceeds tissue by tissue.

**Why the other options are wrong:**

- A, suspended animation: the person is still alive, not dead.
- C, somatic death: refers to the death of the whole organism, not of individual cells.
- D, brainstem death: irreversible loss of brainstem function, a different concept.

**Final Answer:** Molecular (cellular) death $\Rightarrow$ $\boxed{\text{B}}$

**Answer: (B)** Go Back to Q1

**Q2.**

### Solution

**Concept – brainstem death:** The brainstem drives breathing and the basic reflexes that sustain life.

**Step 1 – state the definition:** Brainstem death is the **irreversible cessation of all brainstem functions**, which includes irreversible loss of the capacity to breathe (proven by a positive apnoea test).

**Step 2 – significance:** Once diagnosed, it is legally equivalent to death of the person, even if the heart is kept beating on a ventilator.

**Why the other options are wrong:**

- A, reversible loss of consciousness with preserved reflexes: describes coma, not brain death.
- C, temporary cessation of the heartbeat: unrelated to brainstem death.
- D, isolated cortical EEG flattening with normal breathing: intact brainstem,

so not brainstem death.

**Final Answer:** Irreversible cessation of all brainstem function ⇒ B

**Answer: (B)** Go Back to Q2

## Q3.

### Solution

**Concept – apparent death:** Vital functions can fall so low that they escape ordinary clinical detection.

**Step 1 – name the state:** When the heartbeat and breathing are so feeble that they cannot be detected clinically yet the person is alive and revivable, the condition is **suspended animation** (apparent death).

**Step 2 – examples:** It is seen in drowning, electrocution, hypothermia, and deep anaesthesia; the danger is a mistaken diagnosis of death.

**Why the other options are wrong:**

- A, molecular death: death of cells after somatic death, irreversible.
- B, somatic death: real death of the whole organism.
- D, brainstem death: irreversible, not revivable.

**Final Answer:** Suspended animation ⇒ C

**Answer: (C)** Go Back to Q3

## Q4.

### Solution

**Concept – types of abrasion:** The shape of an abrasion can reveal the causative object.

**Step 1 – read the figure:** The mark reproduces the exact pattern of the object (parallel ridges), so the object has been stamped onto the skin.

**Step 2 – name the type:** This is an **imprint (patterned) abrasion**, in which the wound is a faithful negative of the object, giving it high medico-legal value for identifying the weapon or vehicle.

**Why the other options are wrong:**

- A, graze abrasion: caused by lateral rubbing; it does not reproduce a pattern.

- B, pressure abrasion: caused by sustained pressure (e.g. a ligature), not by a stamped pattern of impact.
- D, linear scratch abrasion: a fine line from a pointed object, again not a pattern.

**Final Answer:** Imprint (patterned) abrasion $\Rightarrow$ C

**Answer: (C)** Go Back to Q4

## Q5.

### Solution

**Concept – pressure abrasion:** Sustained pressure, rather than a moving edge, produces a distinct abrasion.

**Step 1 – identify the mechanism:** A ligature crushing the neck presses the superficial skin, which dries after death into a hard, parchment-like band.

**Step 2 – name the type:** This is a **pressure abrasion**; the ligature mark of hanging and strangulation is its classic example.

**Why the other options are wrong:**

- A, graze abrasion: due to sliding friction, not sustained pressure.
- B, sliding abrasion: another term for a graze; involves movement.
- C, imprint abrasion from a single impact: results from one stamping blow, not from continuous pressure.

**Final Answer:** Pressure abrasion $\Rightarrow$ D

**Answer: (D)** Go Back to Q5

## Q6.

### Solution

**Concept – ligature mark in typical hanging:** The direction and level of the groove separate hanging from strangulation.

**Step 1 – read the figure:** The groove rises on each side of the neck towards the knot, and it is interrupted where the knot lies.

**Step 2 – state the features:** In a typical hanging the mark is **oblique, non-continuous (broken at the knot) and high on the neck above the thyroid cartilage**, running upward towards the point of suspension.

**Why the other options are wrong:**

- B, transverse, continuous, low mark: this is the pattern of ligature strangulation, not hanging.
- C, uniform horizontal groove: again describes strangulation.
- D, even unbroken groove at the root of the neck: not the typical hanging mark.

**Final Answer:** Oblique, non-continuous, high, directed towards the knot $\Rightarrow$ A

**Answer: (A)** Go Back to Q6

## Q7.

### Solution

**Concept – vital signs of antemortem hanging:** Certain findings prove the neck was compressed while the person was alive.

**Step 1 – describe the sign:** Pressure on the salivary glands makes saliva trickle from the lower angle of the mouth, running down the chin and chest along the line of gravity.

**Step 2 – interpret it:** This **dribbling of saliva sign** is a reliable indicator of antemortem hanging, because it needs the victim to have been upright and alive when suspended.

**Why the other options are wrong:**

- B, Tardieu spots: petechial haemorrhages of asphyxia, not salivary dribbling.
- C, Paltauf haemorrhages: subpleural haemorrhages seen in drowning.
- D, postmortem hypostasis: settling of blood after death, unrelated to saliva.

**Final Answer:** Dribbling of saliva sign $\Rightarrow$ A

**Answer: (A)** Go Back to Q7

## Q8.

### Solution

**Concept – eruption of permanent teeth:** The eruption sequence is a standard tool for estimating a child's age.

**Step 1 – read the figure:** The tooth marked X sits at the back of the arch behind the deciduous teeth and erupts without any deciduous predecessor.

**Step 2 – name it:** The **first permanent molar** erupts at about 6 years and is the earliest permanent tooth, which is why it is called the "6-year molar".

**Why the other options are wrong:**

- A, central incisor: the permanent central incisor erupts at about 7 years, after the first molar.
- B, lateral incisor: erupts later, at about 8 years.
- D, first premolar: erupts at about 9 to 10 years.

**Final Answer:** First permanent molar $\Rightarrow$ C

**Answer: (C)** Go Back to Q8

## Q9.

### Solution

**Concept – Gustafson's method:** Age can be estimated from the regressive changes in a single tooth.

**Step 1 – count the criteria:** Gustafson scored **six** age-related changes: attrition, periodontosis, secondary dentine deposition, cementum apposition, root resorption and root (dentine) transparency.

**Step 2 – how it works:** Each change is graded 0 to 3, the scores are summed, and the total is fitted to a regression line to read off the age.

**Why the other options are wrong:**

- A, three; B, four; C, five: all understate the number; Gustafson used six distinct parameters.

**Final Answer:** Six $\Rightarrow$ D

**Answer: (D)** Go Back to Q9

## Q10.

### Solution

**Concept – eruption of the second molar:** Later molars mark later ages in the eruption chart.

**Step 1 – place the tooth:** The second permanent molar (the "12-year molar") erupts once the first molar and the incisors, canine and premolars are already in place.

**Step 2 – state the age:** It erupts at about **12 years**, a widely used landmark in dental age estimation.

**Why the other options are wrong:**

- A, 6 years: the age of the first permanent molar, not the second.
- B, 9 years: roughly the age of the first premolar.
- D, 18 years: the approximate age of the third molar (wisdom tooth).

**Final Answer:** 12 years $\Rightarrow$ C

**Answer: (C)** Go Back to Q10

## Q11.

### Solution

**Concept – toxicology definitions:** Fatal dose and fatal period are separate ideas.

**Step 1 – define the fatal period:** The **fatal period** is the time interval between the intake of a poison and the resulting death.

**Step 2 – contrast with fatal dose:** The fatal dose is a quantity of poison; the fatal period is a duration of time. Both vary with the poison, the dose and the route.

**Why the other options are wrong:**

- A, smallest amount likely to cause death: this defines the fatal (lethal) dose.
- C, largest tolerated dose: describes a maximum safe dose, not the fatal period.
- D, time for complete excretion: relates to elimination, not the time to death.

**Final Answer:** Time between intake of the poison and death $\Rightarrow$ B

**Answer: (B)** Go Back to Q11

## Q12.

### Solution

**Concept – gastrointestinal decontamination:** Modern practice favours adsorption over emptying the stomach.

**Step 1 – choose the measure: Oral activated charcoal**, given early to a conscious cooperative patient, adsorbs most poisons in the gut and prevents their absorption; it is the single most useful decontamination step.

**Step 2 – caveat:** It does not bind iron, lithium, alcohols, strong acids or alkalis, and it must not be given if the airway is unprotected.

**Why the other options are wrong:**

- A, forced emesis with ipecac: now abandoned because of the aspiration risk and poor benefit.
- B, routine lavage after 6 hours: of little value so late and is not done routinely.
- C, whole-bowel irrigation for every poison: reserved for special cases such as iron or sustained-release drugs, not all poisons.

**Final Answer:** Oral activated charcoal ⇒ D

**Answer: (D)** Go Back to Q12

## Q13.

### Solution

**Concept – antidotes in organophosphate poisoning:** Two drugs are used, but only one reactivates the enzyme.

**Step 1 – name the reactivator: Pralidoxime (2-PAM)** is an oxime that removes the phosphate group from inhibited acetylcholinesterase, regenerating the active enzyme, and it relieves both muscarinic and nicotinic effects.

**Step 2 – timing:** It must be given early, before "ageing" of the enzyme makes the inhibition irreversible.

**Why the other options are wrong:**

- B, atropine: blocks muscarinic receptors and dries secretions but does not reactivate the enzyme.
- C, naloxone: the antidote for opioid poisoning.
- D, N-acetylcysteine: the antidote for paracetamol poisoning.

**Final Answer:** Pralidoxime (2-PAM) ⇒ A

**Answer: (A)** Go Back to Q13

## Q14.

**Solution**

**Concept – muscarinic versus nicotinic effects:** Organophosphates flood both receptor types, but the mnemonic DUMBELS lists the muscarinic ones.

**Step 1 – recall DUMBELS:** Diarrhoea, Urination, Miosis, Bradycardia/Bronchorrhoea, Emesis, Lacrimation and **Salivation** are the muscarinic effects.

**Step 2 – match the option: Excessive salivation and lacrimation** are classic muscarinic features and are the correct answer.

**Why the other options are wrong:**

- A, muscle fasciculations: a nicotinic effect at the neuromuscular junction.
- C, tachycardia with dilated pupils: muscarinic stimulation causes bradycardia and pinpoint pupils, so this is the opposite pattern.
- D, flaccid muscle paralysis: a nicotinic effect from persistent depolarisation.

**Final Answer:** Excessive salivation and lacrimation $\Rightarrow$ B

**Answer: (B)** Go Back to Q14

## Q15.

**Solution**

**Concept – aluminium phosphide poisoning:** This common agrochemical (celphos) kills by releasing phosphine gas.

**Step 1 – describe the picture:** On contact with moisture or gastric acid, aluminium phosphide liberates phosphine, giving a **garlicky (decaying-fish) breath odour, refractory hypotension and severe metabolic acidosis**; there is no specific antidote and treatment is supportive.

**Step 2 – mechanism:** Phosphine blocks mitochondrial cytochrome c oxidase, so cells cannot use oxygen, and profound shock follows.

**Why the other options are wrong:**

- B, bitter-almond odour: characteristic of cyanide, not phosphide.
- C, cherry-red skin: a feature of carbon monoxide poisoning.
- D, prompt response to dimercaprol: BAL is the antidote for arsenic and some heavy metals, not for aluminium phosphide, which has no specific antidote.

**Final Answer:** Garlicky breath with refractory hypotension and acidosis, no spe-

cific antidote $\Rightarrow$ A

**Answer: (A)** Go Back to Q15

# Answer Key

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