

INI CET Forensic Medicine

Sample Paper – 4

Duration: 14 Minutes

Maximum Marks: 15

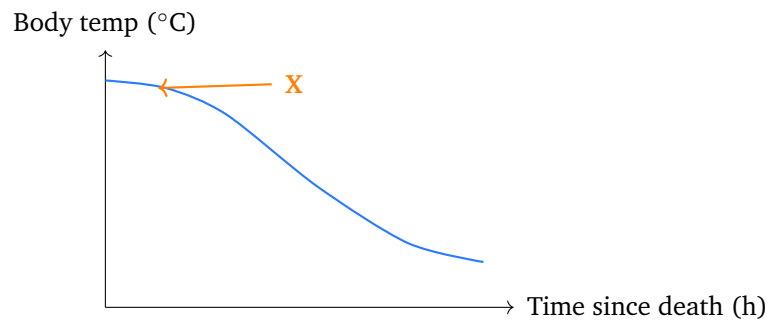
Instructions

- This paper contains **15** Multiple Choice Questions (Single Best Response), modelled on the Forensic Medicine and Toxicology 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 postmortem cooling of the body used to estimate the time since death is termed:
- (A) Algor mortis
(B) Rigor mortis
(C) Livor mortis
(D) Pallor mortis
- Q2.** The graph shows the postmortem body-temperature curve. The early plateau (marked X), the lag before the temperature falls steadily, occurs because:





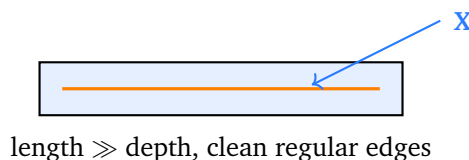
- (A) Rigor mortis generates heat in the muscles
- (B) Residual metabolic heat and a gradient must build before rapid loss begins
- (C) The thermometer takes time to equilibrate
- (D) Putrefaction warms the core

Q3. The overall shape of the postmortem body-cooling curve, plotted against time, is best described as:

- (A) Sigmoid (an initial plateau, then a steep fall, then flattening)
- (B) A straight line of constant slope
- (C) An exponential rise
- (D) A flat horizontal line

Mechanical Injuries

Q4. The diagram shows a skin wound whose length on the surface is far greater than its depth, with clean-cut, even, regular margins and no bruising or tissue bridging. This is a/an:



- (A) Lacerated wound
- (B) Abrasion
- (C) Contusion

(D) Incised wound

Q5. Multiple small, shallow, parallel cuts alongside a deeper wound at the site of self-inflicted injury are known as:

- (A) Hesitation (tentative) cuts
- (B) Defence wounds
- (C) Chop wounds
- (D) Fabricated wounds

Asphyxial Deaths

Q6. Death caused by closing the external nose and mouth openings, for example by a hand or a pillow, so that air cannot enter, is termed:

- (A) Choking
- (B) Throttling
- (C) Smothering
- (D) Drowning

Q7. Which finding is most characteristic of a death from mechanical asphyxia such as smothering or gagging?

- (A) Cherry-red postmortem lividity
- (B) Petechial haemorrhages, cyanosis and congestion
- (C) A rigid, board-like abdomen
- (D) Bright red, well-oxygenated blood in the heart

Forensic Identification and Medical Jurisprudence

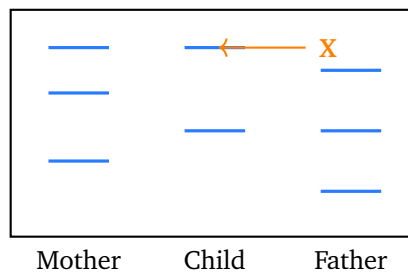
Q8. DNA fingerprinting for forensic identification is based mainly on the analysis of:

- (A) The ABO blood group antigens
- (B) Short tandem repeats (STRs), highly variable regions of DNA



- (C) The whole coding sequence of every gene
- (D) Mitochondrial protein content

Q9. In the DNA profile shown, every band in the child's lane (marked X) matches a band present in either the mother's lane or the alleged father's lane. This means the alleged father:



- (A) Is definitely excluded as the biological father
 - (B) Is proven to be an identical twin
 - (C) Result is uninterpretable
 - (D) Cannot be excluded and is very likely the biological father
- Q10.** Apart from parentage testing, DNA fingerprinting is most useful in forensic practice for:
- (A) Estimating the exact time since death
 - (B) Identifying a person from a small biological stain such as blood, semen or hair root
 - (C) Determining the calibre of a firearm
 - (D) Measuring blood alcohol concentration

General Toxicology and Corrosive Poisons

- Q11.** Acute arsenic poisoning classically presents with severe vomiting and a profuse watery diarrhoea likened to:
- (A) Currant-jelly stools
 - (B) Melaena
 - (C) Rice-water stools



(D) Steatorrhoea

Q12. The specific chelating antidote used in arsenic poisoning is:

- (A) BAL (dimercaprol)
- (B) Atropine
- (C) Naloxone
- (D) Pralidoxime

Specific Poisons

Q13. The classic triad of acute opioid (morphine) poisoning is pinpoint pupils, depressed respiration and:

- (A) Hypertension
- (B) Dilated pupils
- (C) Hyperthermia
- (D) Coma (depressed consciousness)

Q14. The specific antidote that rapidly reverses respiratory depression in acute opioid overdose is:

- (A) Flumazenil
- (B) Physostigmine
- (C) Naloxone
- (D) Vitamin K

Q15. Which statement about barbiturate and benzodiazepine (CNS-depressant) poisoning is correct?

- (A) Both cause dilated fixed pupils and hyperreflexia
- (B) Flumazenil is the specific antidote for barbiturate overdose
- (C) Both act on GABA and cause CNS depression; flumazenil reverses benzodiazepines, while barbiturate overdose is managed supportively
- (D) Barbiturates have a wide safety margin and rarely cause death



Detailed Solutions**Q1.****Solution**

Concept – postmortem changes: Each Latin term names a distinct change after death.

Step 1 – define the cooling: **Algor mortis** is the progressive cooling of the body after death as it loses heat to the surroundings.

Step 2 – use: Because the fall is fairly orderly, it helps estimate the time since death in the early postmortem period.

Why the other options are wrong:

- B, rigor mortis: stiffening of muscles, not cooling.
- C, livor mortis: postmortem hypostasis (lividity) from settling of blood.
- D, pallor mortis: the early paleness of the skin, not the cooling curve.

Final Answer: Algor mortis ⇒ A

Answer: (A) [Go Back to Q1](#)

Q2.**Solution**

Concept – the cooling curve: Body cooling is not linear from the moment of death.

Step 1 – read X: The early flat part (plateau) marked X is the **initial temperature plateau**.

Step 2 – explain it: Just after death, residual metabolic heat is still being produced and a temperature gradient between core and skin has to build up before the core temperature starts falling rapidly.

Why the other options are wrong:

- A, rigor heat: rigor mortis does not add meaningful heat.
- C, thermometer lag: an instrument artefact, not the physiological plateau.
- D, putrefaction: warms the body much later and irregularly, not in this early phase.

Final Answer: Residual heat and gradient build-up ⇒ B

Answer: (B) [Go Back to Q2](#)



Q3.

Solution

Concept – shape of cooling: Plotting body temperature against time gives a characteristic curve.

Step 1 – name the shape: The curve is **sigmoid**: an initial plateau, then a steep fairly linear fall, then flattening as body temperature approaches the environmental temperature.

Step 2 – why it matters: Newton's law of cooling assumes a simple exponential, but the real plateau at the start and the tail at the end make the true curve S-shaped, so time-since-death formulae are only approximate.

Why the other options are wrong:

- B, straight line: ignores both the plateau and the terminal flattening.
- C, exponential rise: the temperature falls, it does not rise.
- D, flat line: temperature clearly changes with time.

Final Answer: Sigmoid curve $\Rightarrow$

Answer: (A) [Go Back to Q3](#)

Q4.

Solution

Concept – classifying sharp-force wounds: The ratio of length to depth and the character of the margins define the wound type.

Step 1 – identify X: A wound whose surface length is greater than its depth, with clean, regular, everted margins and no bruising or tissue bridging, is an **incised wound**, caused by a sharp cutting edge drawn across the skin.

Step 2 – contrast with a stab: A stab (punctured) wound is deeper than it is long; an incised wound is longer than it is deep.

Why the other options are wrong:

- A, lacerated wound: caused by blunt force, with irregular ragged margins and tissue bridging.
- B, abrasion: a superficial graze of the epidermis only.
- C, contusion: a bruise from blunt trauma, with no break in the skin.

Final Answer: Incised wound $\Rightarrow$



Answer: (D) [Go Back to Q4](#)

Q5.

Solution

Concept – suicidal sharp-force injury: Self-inflicted cuts often carry a tell-tale pattern.

Step 1 – name the finding: Multiple small, shallow, parallel cuts beside the deeper fatal wound are **hesitation (tentative) cuts**, made as the person gathers courage before the decisive stroke.

Step 2 – significance: They are typically over accessible sites (wrist, front of neck), point strongly to a suicidal manner, and help distinguish suicide from homicide.

Why the other options are wrong:

- B, defence wounds: on the palms or forearms, seen when warding off an attacker (homicide).
- C, chop wounds: deep gaping wounds from a heavy sharp-edged weapon such as an axe.
- D, fabricated wounds: self-inflicted to bring a false charge, usually superficial and over reachable areas but not the courage-gathering pattern beside a fatal cut.

Final Answer: Hesitation cuts $\Rightarrow$ A

Answer: (A) [Go Back to Q5](#)

Q6.

Solution

Concept – types of mechanical asphyxia: Each type has a defined mechanism of blocking air entry.

Step 1 – match the mechanism: Closing the external nostrils and mouth so that air cannot enter the airway is **smothering**.

Step 2 – context: It is commonly seen in infanticide (pillow), in the helpless or intoxicated, and sometimes accidentally.

Why the other options are wrong:

- A, choking: obstruction inside the air passages by a foreign body, not at the



external openings.

- B, throttling: manual strangulation by compressing the neck with the hands.
- D, drowning: asphyxia from a liquid medium occluding the airway.

Final Answer: Smothering ⇒

Answer: (C) [Go Back to Q6](#)

Q7.

Solution

Concept – signs of asphyxia: Mechanical asphyxia leaves a triad of congestive changes.

Step 1 – name the findings: Petechial haemorrhages (Tardieu spots), **cyanosis** and **visceral congestion** are the classic general signs of asphyxial death, including smothering and gagging.

Step 2 – mechanism: Obstruction to venous return and hypoxia raise capillary pressure, rupturing small vessels to give pinpoint haemorrhages.

Why the other options are wrong:

- A, cherry-red lividity: a feature of carbon monoxide (and cyanide) poisoning, not mechanical asphyxia.
- C, board-like abdomen: a sign of peritonitis, unrelated.
- D, bright red oxygenated blood: the opposite of the dark, fluid, deoxygenated blood of asphyxia.

Final Answer: Petechiae, cyanosis and congestion ⇒

Answer: (B) [Go Back to Q7](#)

Q8.

Solution

Concept – basis of DNA fingerprinting: Identity rests on the variable, non-coding parts of the genome.

Step 1 – name the target: DNA fingerprinting analyses **short tandem repeats (STRs)**, highly polymorphic regions that vary in copy number between individuals.

Step 2 – why they work: Because the number of repeats at each locus differs widely, a panel of STR loci gives a profile essentially unique to each person (except



identical twins).

Why the other options are wrong:

- A, ABO antigens: only a few blood groups, far too little discriminating power.
- C, whole coding sequence: coding genes are highly conserved and poorly discriminating; the technique targets variable non-coding repeats.
- D, mitochondrial protein: identification uses DNA sequence, not protein content.

Final Answer: Short tandem repeats (STRs) ⇒ B

Answer: (B) [Go Back to Q8](#)

Q9.

Solution

Concept – interpreting a paternity profile: A child inherits one allele of each pair from each parent.

Step 1 – apply the rule: Half of the child's bands must match the mother; the remaining (obligate paternal) bands must match the true father. If every paternal band is present in the alleged father, he **cannot be excluded** and is very likely the biological father.

Step 2 – reporting: DNA testing can definitely exclude a wrongly accused man, but for inclusion it gives a very high probability of paternity rather than absolute proof.

Why the other options are wrong:

- A, excluded: exclusion requires paternal bands that are absent in the alleged father, which is not the case here.
- B, identical twin: not shown by a matching profile in a paternity test.
- C, uninterpretable: the profile is clear and interpretable.

Final Answer: Cannot be excluded, very likely the father ⇒ D

Answer: (D) [Go Back to Q9](#)



Q10.

Solution

Concept – forensic uses of DNA: DNA can identify a person from a very small biological trace.

Step 1 – name the main use: Its chief forensic value is **identifying an individual from a small biological sample** such as blood, semen, saliva, or a hair root left at a scene, and in identifying decomposed or mutilated bodies and mass-disaster victims.

Step 2 – link to crime: Matching a crime-scene stain to a suspect's profile establishes or excludes contact.

Why the other options are wrong:

- A, time since death: estimated from postmortem changes, not DNA.
- C, firearm calibre: a ballistics question, not a DNA one.
- D, blood alcohol: measured by chemical assay, not DNA typing.

Final Answer: Identifying a person from a small biological stain ⇒ **B**

Answer: (B) [Go Back to Q10](#)

Q11.

Solution

Concept – acute arsenic poisoning: Arsenic irritates the gut and mimics gastroenteritis.

Step 1 – name the finding: Acute arsenic poisoning causes violent vomiting and a profuse watery diarrhoea classically described as **rice-water stools**, closely resembling cholera.

Step 2 – other features: Burning abdominal pain, garlicky breath, dehydration and shock follow; chronic exposure gives pigmentation, hyperkeratosis and Mees' lines on the nails. Its odourless, tasteless nature made it a notorious homicidal poison.

Why the other options are wrong:

- A, currant-jelly stools: seen in intussusception.
- B, melaena: black tarry stool of upper GI bleeding.
- D, steatorrhoea: fatty stool of malabsorption.

Final Answer: Rice-water stools ⇒ **C**



Answer: (C) [Go Back to Q11](#)

Q12.

Solution

Concept – antidotes to heavy metals: Chelators bind the metal for excretion.

Step 1 – name the antidote: The specific antidote for arsenic poisoning is **BAL (dimercaprol)**, a chelating agent; oral succimer (DMSA) is an alternative.

Step 2 – how it works: BAL provides thiol (-SH) groups that bind arsenic, forming a stable complex excreted in the urine.

Why the other options are wrong:

- B, atropine: antidote for organophosphate and muscarinic poisoning.
- C, naloxone: antidote for opioids.
- D, pralidoxime: reactivates cholinesterase in organophosphate poisoning.

Final Answer: BAL (dimercaprol) ⇒ A

Answer: (A) [Go Back to Q12](#)

Q13.

Solution

Concept – the opioid overdose triad: Three signs together suggest opioid poisoning.

Step 1 – complete the triad: Pinpoint (miotic) pupils and depressed respiration together with **coma (depressed consciousness)** form the classic morphine/opioid triad.

Step 2 – danger: Respiratory depression is the usual cause of death; hypoxia and pulmonary oedema may supervene.

Why the other options are wrong:

- A, hypertension: opioids tend to cause hypotension, not hypertension.
- B, dilated pupils: opioids cause pinpoint pupils; dilatation occurs only in terminal hypoxia.
- C, hyperthermia: opioids more often cause hypothermia.

Final Answer: Coma ⇒ D

Answer: (D) [Go Back to Q13](#)



Q14.

Solution

Concept – opioid antidote: A competitive receptor blocker reverses the effect.

Step 1 – name it: **Naloxone** is the specific antidote; it is a competitive opioid-receptor antagonist that rapidly restores respiration.

Step 2 – caution: Its short half-life means repeated doses may be needed, and it can precipitate acute withdrawal in dependent patients.

Why the other options are wrong:

- A, flumazenil: reverses benzodiazepines, not opioids.
- B, physostigmine: used in anticholinergic poisoning.
- D, vitamin K: antidote for warfarin/coumarin anticoagulants.

Final Answer: Naloxone ⇒

Answer: (C) [Go Back to Q14](#)

Q15.

Solution

Concept – CNS-depressant sedatives: Barbiturates and benzodiazepines both act through GABA.

Step 1 – identify the correct statement: Both enhance **GABA** activity and cause CNS depression (drowsiness, coma, respiratory depression). **Flumazenil** specifically reverses benzodiazepines, whereas **barbiturate overdose has no specific antidote** and is managed supportively (airway, ventilation, alkaline diuresis for phenobarbitone).

Step 2 – clinical picture: Pupils are usually normal or small, reflexes depressed; barbiturates have a narrow safety margin and can be lethal.

Why the other options are wrong:

- A, dilated pupils and hyperreflexia: incorrect; CNS depressants cause depressed reflexes, not hyperreflexia.
- B, flumazenil for barbiturates: wrong; flumazenil works only on benzodiazepines.
- D, wide safety margin: barbiturates have a narrow margin and readily cause fatal overdose.

Final Answer: GABA-mediated depression; flumazenil for benzodiazepines only



⇒

Answer: (C) [Go Back to Q15](#)



Answer Key

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

