INI CET Forensic Medicine

Sample Paper – 5

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 earliest external sign of putrefaction, a greenish discolouration of the skin, appears first over which region of the body?

(A) Over the sternum

(B) Right iliac fossa (over the caecum)

(C) Over the face and neck

(D) Soles of the feet

Q2. Marbling in a putrefying body, the reddish-brown branching network seen along the superficial veins, is produced by:

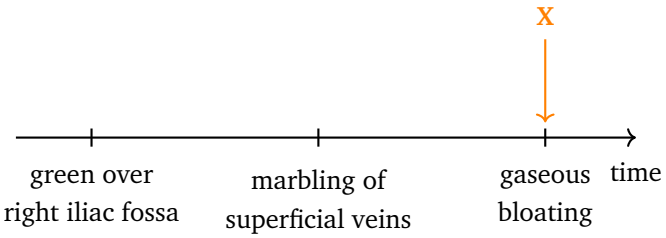
(A) Settling of blood under gravity (post-mortem hypostasis)

(B) Rigor mortis fixing the vessel walls

(C) Haemolysed blood staining vessel walls as haemoglobin reacts with hydrogen sulphide to form sulphmethaemoglobin

(D) Fat breakdown into adipocere along the veins

Q3. The diagram shows the time sequence of external putrefactive changes in a temperate climate. The stage marked **X**, with gaseous bloating of the face and abdomen, protrusion of the tongue and eyes, and the "pugilistic" swollen appearance, appears at roughly:



(A) About 48 to 72 hours after death

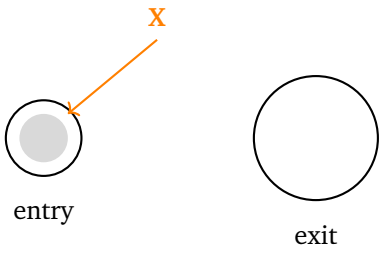
(B) Within the first 6 hours after death

(C) About 12 to 18 hours after death

(D) About 2 to 3 weeks after death

Mechanical Injuries

Q4. The schematic compares the two wounds produced by a single through-and-through bullet track. The smaller wound marked **X** is the entry wound. Which feature is characteristic of a firearm **entry** wound?



(A) Everted margins with no surrounding abrasion

(B) Inverted margins with a surrounding abrasion (grease) collar

(C) Always larger and more ragged than the exit wound

(D) Protrusion of subcutaneous fat and muscle through the wound

Q5. Which statement about a typical firearm **exit** wound is correct?

(A) It shows a clean abrasion collar around inverted margins

(B) It shows tattooing (stippling) from unburnt powder grains

(C) It shows a blackened, singed margin from flame and smoke

(D) It has everted margins, is often larger and more irregular, and lacks an abrasion collar

Asphyxial Deaths

Q6. A worker trapped under a collapsed wall is recovered dead with a deeply congested, cyanosed, purple face and neck studded with petechial haemorrhages, sharply demarcated from the pale chest below. This appearance (Masson's sign) is typical of:

(A) Ligature strangulation

(B) Traumatic (crush) asphyxia

(C) Drowning

(D) Carbon monoxide poisoning

Q7. The mechanism of death in traumatic asphyxia is best explained by:

(A) Fixation of the chest by external compression preventing respiratory movements

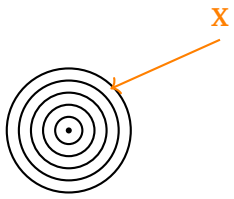
(B) Direct occlusion of the airway lumen by a foreign body

(C) Constriction of the neck vessels by a ligature

(D) Replacement of alveolar air by an irrespirable gas

Forensic Identification and Medical Jurisprudence

Q8. The fingerprint pattern sketched below (marked **X**), in which the ridges form concentric circles or a spiral around a central core with two deltas, is classified as a:



ridge pattern

(A) Whorl

(B) Loop

(C) Arch

(D) Tented arch

Q9. Identification of a person by the study of friction-ridge patterns is called dactylography. The scientist who first demonstrated that fingerprints are permanent and individually unique and classified them into loops, whorls and arches was:

(A) Alphonse Bertillon

(B) Sir Francis Galton

(C) Edmond Locard

(D) Karl Landsteiner

Q10. The method of personal identification based on the number, size, shape and position of the sweat pores opening on the friction ridges is termed:

(A) Anthropometry

(B) Dermatoglyphics

(C) Poroscopy

(D) Odontology

General Toxicology and Corrosive Poisons

Q11. Which of the following is a recognised feature of chronic lead (plumbism) poisoning?

(A) Basophilic stippling of red blood cells

(B) Burton's line, a blue-grey lead line along the gum margins

(C) Wrist drop from radial (extensor) nerve palsy

(D) All of the above

Q12. The chelating agent of choice for the treatment of chronic lead poisoning is:

(A) Atropine

(B) Naloxone

(C) Deferoxamine

(D) Calcium disodium edetate ($CaNa_2EDTA$)

Specific Poisons

Q13. A young man brought after eating datura seeds is delirious with dry flushed skin, widely dilated pupils, a rapid pulse and urinary retention ("mad as a hatter, red as a beet, dry as a bone, hot as a hare, blind as a bat"). This toxidrome is:

(A) Cholinergic (muscarinic excess)

(B) Opioid

(C) Anticholinergic

(D) Sympathomimetic (serotonin excess)

Q14. The deadly nightshade plant, whose alkaloids atropine and hyoscine produce the anticholinergic syndrome and from which the antidote to organophosphate poisoning is derived, is:

(A) Nerium oleander

(B) Aconitum napellus

(C) Atropa belladonna

(D) Abrus precatorius

Q15. Which of the following is a cardiac plant poison whose seeds ("lucky nut") contain cardiac glycosides producing digitalis-like arrhythmias, bradycardia and hyperkalaemia?

(A) Yellow oleander (Cerbera thevetia)

(B) Datura stramonium

(C) Ricinus communis (castor)

(D) Semecarpus anacardium (marking nut)

Detailed Solutions

Q1.

Solution

Concept – onset of putrefaction: Putrefaction is bacterial and starts where gut organisms are most abundant.

Step 1 – locate the first sign: The earliest external change is a **greenish discolouration over the right iliac fossa**, overlying the caecum.

Step 2 – reason: The caecum is thin-walled, superficial and loaded with coliform bacteria and gas, so decomposition shows here first.

Why the other options are wrong:

- A, sternum: not the earliest site.
- C, face and neck: greens later, once gases spread.
- D, soles: decompose late.

Final Answer: Right iliac fossa $\Rightarrow$ B

Answer: (B) Go Back to Q1

Q2.

Solution

Concept – marbling: Marbling is a distinctive branching venous pattern of decomposition.

Step 1 – mechanism: Haemolysed blood diffuses into the vessel walls, and haemoglobin reacts with **hydrogen sulphide** produced by bacteria to form **sulphmethaemoglobin**.

Step 2 – appearance: This stains the superficial veins a reddish-brown to greenish colour, outlining them as a marble-like network, typically by 36 to 48 hours.

Why the other options are wrong:

- A, hypostasis: post-mortem lividity, a separate change.
- B, rigor mortis: muscle stiffening, unrelated to the venous pattern.
- D, adipocere: a late modification of putrefaction, not marbling.

Final Answer: Sulphmethaemoglobin staining vessel walls $\Rightarrow$ C

Answer: (C) Go Back to Q2

Q3.

Solution

Concept – sequence of putrefaction: Colour changes precede gas formation.

Step 1 – read the timeline: Green over the right iliac fossa (12 to 18 hours) is followed by marbling (36 to 48 hours) and then **gaseous bloating** at the stage marked X.

Step 2 – timing of X: Bacterial gas production distends the face and abdomen, everts the tongue and eyes and gives the swollen "pugilistic" look at about **48 to 72 hours**.

Why the other options are wrong:

- B, within 6 hours: far too early; putrefaction has not begun.
- C, 12 to 18 hours: that is the first green discolouration, not bloating.
- D, 2 to 3 weeks: that is late colliquative putrefaction and skeletonisation.

Final Answer: About 48 to 72 hours $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q3

Q4.

Solution

Concept – entry versus exit wound: A bullet punches inward at entry and pushes outward at exit.

Step 1 – identify X: The entry wound has **inverted (indrawn) margins** with a surrounding **abrasion (grease) collar** as the spinning bullet scrapes and wipes the skin.

Step 2 – confirm: It is usually the smaller and rounder of the two wounds.

Why the other options are wrong:

- A, everted with no abrasion: that describes the exit wound.
- C, larger and ragged: that is typically the exit wound.
- D, protruding fat and muscle: a feature of the exit, not the entry.

Final Answer: Inverted margins with an abrasion collar $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q4

Q5.

Solution

Concept – exit wound features: The bullet bursts outward as it leaves.

Step 1 – describe the exit: The exit wound has **everted margins, is often larger and more irregular, and has no abrasion collar**.

Step 2 – reason: The bullet may tumble or fragment and drives tissue outward, so no clean wipe collar forms.

Why the other options are wrong:

- A, abrasion collar with inverted margins: features of the entry wound.
- B, tattooing (stippling): a close-range entry feature.
- C, blackened singed margin: a contact or near-contact entry feature (flame and smoke).

Final Answer: Everted, larger, irregular, no collar $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q5

Q6.

Solution

Concept – traumatic (crush) asphyxia: Chest compression obstructs venous return from the head.

Step 1 – read the picture: Deep congestion and cyanosis of the face and neck with dense petechiae, sharply cut off at the compressed chest, is **Masson's sign** of traumatic asphyxia.

Step 2 – mechanism of the sign: Blocked venous drainage backs blood into the head and neck, rupturing capillaries.

Why the other options are wrong:

- A, ligature strangulation: a neck ligature mark, not chest compression.
- C, drowning: froth at mouth and nostrils, not this demarcated congestion.
- D, carbon monoxide: cherry-red, not cyanotic and petechial.

Final Answer: Traumatic (crush) asphyxia $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q6

Q7.

Solution

Concept – mechanism of traumatic asphyxia: The name points to the cause of death.

Step 1 – state the mechanism: A heavy external load **fixes the chest and prevents respiratory movements**, so the lungs cannot ventilate.

Step 2 – result: Respiration is mechanically arrested and venous return from the head is obstructed, producing hypoxia and the facial congestion.

Why the other options are wrong:

- B, luminal occlusion: that is choking or a foreign body.
- C, neck constriction: that is strangulation or hanging.
- D, irrespirable gas: that is asphyxia from a toxic atmosphere.

Final Answer: Chest fixed by external compression $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q7

Q8.

Solution

Concept – fingerprint pattern types: Loops, whorls and arches are the three basic patterns.

Step 1 – read X: Ridges forming **concentric circles or a spiral** around a central core, with two deltas, define a **whorl**.

Step 2 – frequency: Whorls make up roughly a quarter of all patterns.

Why the other options are wrong:

- B, loop: ridges enter and leave on the same side with one delta.
- C, arch: ridges sweep across with no delta and no core.
- D, tented arch: an arch with a sharp upthrust, still no true core or two deltas.

Final Answer: Whorl $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q8

Q9.

Solution

Concept – history of dactylography: Several workers contributed to fingerprint science.

Step 1 – name the scientist: Sir Francis Galton showed fingerprints are permanent and unique and grouped them into loops, whorls and arches.

Step 2 – context: His work formed the basis of the later Henry classification used by police.

Why the other options are wrong:

- A, Bertillon: devised anthropometry (body measurements), not fingerprints.
- C, Locard: known for the exchange principle and poroscopy.
- D, Landsteiner: discovered the ABO blood groups.

Final Answer: Sir Francis Galton $\Rightarrow$ B

Answer: (B) Go Back to Q9

Q10.

Solution

Concept – identification methods: Different methods use different ridge details.

Step 1 – define the method: Poroscopy identifies a person from the number, size, shape and position of the **sweat pores** on the friction ridges, introduced by Edmond Locard.

Step 2 – use: Pores are permanent, so poroscopy is useful even with a partial print.

Why the other options are wrong:

- A, anthropometry: body measurements (the Bertillon system).
- B, dermatoglyphics: study of ridge patterns for medical and genetic correlations.
- D, odontology: identification from teeth.

Final Answer: Poroscopy $\Rightarrow$ C

Answer: (C) Go Back to Q10

Q11.

Solution

Concept – chronic lead poisoning: Plumbism affects blood, gums and nerves.

Step 1 – list the features: Basophilic stippling of red cells, **Burton's line** on the gums and **wrist drop** from radial nerve palsy are all classic, so all are correct.

Step 2 – add-ons: Anaemia, colic, a lead line at the metaphyses in children and encephalopathy also occur.

Why the other options are wrong:

- A, B and C are each true individually, so no single one is the best answer.
- Only option D captures all three recognised features.

Final Answer: All of the above ⇒ D

Answer: (D) Go Back to Q11

Q12.

Solution

Concept – chelation therapy: Each metal poison has a preferred chelator.

Step 1 – name the antidote: Calcium disodium edetate ($CaNa_2EDTA$) is the chelating agent of choice for lead, often with BAL (dimercaprol) in severe cases or oral DMSA (succimer).

Step 2 – action: It binds lead and promotes its urinary excretion.

Why the other options are wrong:

- A, atropine: antidote for organophosphate and muscarinic poisoning.
- B, naloxone: antidote for opioid poisoning.
- C, deferoxamine: chelator for iron, not lead.

Final Answer: Calcium disodium edetate ⇒ D

Answer: (D) Go Back to Q12

Q13.

Solution

Concept – datura toxidrome: Datura alkaloids block muscarinic receptors.

Step 1 – read the picture: Dry flushed skin, dilated pupils, tachycardia, urinary retention and delirium make the classic **anticholinergic** toxidrome.

Step 2 – mnemonic: "Mad, red, dry, hot and blind" summarises central and peripheral muscarinic blockade.

Why the other options are wrong:

- A, cholinergic: the opposite picture, with salivation, sweating and small pupils.
- B, opioid: pinpoint pupils and respiratory depression.
- D, sympathomimetic/serotonin: sweating and clonus rather than dry skin.

Final Answer: Anticholinergic ⇒ C

Answer: (C) Go Back to Q13

Q14.

Solution

Concept – source of atropine: The anticholinergic alkaloids come from the nightshade family.

Step 1 – name the plant: Atropa belladonna, the deadly nightshade, yields atropine and hyoscine; datura belongs to the same family.

Step 2 – clinical link: Atropine from this source is the antidote used in organophosphate poisoning.

Why the other options are wrong:

- A, Nerium oleander: a cardiac (glycoside) poison, not anticholinergic.
- B, Aconitum napellus: aconite, a cardiac and neurotoxic poison.
- D, Abrus precatorius: jequirity, whose toxalbumin abrin causes cellular poisoning.

Final Answer: Atropa belladonna ⇒ C

Answer: (C) Go Back to Q14

Q15.

Solution

Concept – cardiac plant poisons: Some plants contain digitalis-like glycosides.

Step 1 – name the poison: Yellow oleander (Cerbera thevetia), whose seeds are called the "lucky nut", contains cardiac glycosides (thevetin) causing bradycardia, arrhythmias and hyperkalaemia like digitalis.

Step 2 – relevance: It is a common agent of both suicidal and accidental poisoning in South Asia.

Why the other options are wrong:

- B, Datura stramonium: an anticholinergic (deliriant) plant poison.
- C, Ricinus communis (castor): its toxalbumin ricin causes cellular poisoning.
- D, Semecarpus anacardium: the marking nut, an irritant and vesicant.

Final Answer: Yellow oleander (Cerbera thevetia) $\Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q15

Answer Key

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