CUET PG Forensic Science Question Paper with Solutions

Time Allowed :1 hour 45 minutes	**Maximum Marks :**300	**Total questions :**75

General Instructions

Read the following instructions very carefully and strictly follow them:

(i) This question paper comprises 75 questions. All questions are compulsory.

(ii) Each question carries 04 (four) marks.

(iii) For each correct response, candidate will get 04 (four) marks.

(iv) For each incorrect response, 01 (one) mark will be deducted from the total score.

(v) Un-answered/un-attempted response will be given no marks.

(vi) To answer a question, the candidate needs to choose one option as correct option.

(vii) However, after the process of Challenges of the Answer Key, in case there are multiple correct options or change in key, only those candidates who have attempted it correctly as per the revised Final Answer Key will be awarded marks.

(viii) In case a Question is dropped due to some technical error, full marks shall be given to all the candidates irrespective of the fact who have attempted it or not

1. Match the following:

List-I	List-II
(A) Spinal poison	(I) Carbon monoxide
(B) Cardiac poison	(II) Mercury
(C) Asphyxiant	(III) Strychnine
(D) Nephrotoxic	(IV) Aconite

Choose the correct option from the following:

(1) (A) - (I), (B) - (III), (C) - (I), (D) - (IV)

(2) (A) - (I), (B) - (IV), (C) - (I), (D) - (III)

(3) (A) - (I), (B) - (I), (C) - (IV), (D) - (III)

(4) (A) - (I), (B) - (IV), (C) - (I), (D) - (I)

Correct Answer: (4) (A) - (I), (B) - (IV), (C) - (I), (D) - (III)

Solution:

- **Spinal poison:** Carbon monoxide interferes with oxygen delivery to tissues, causing neurological damage and affecting spinal cord function.
- **Cardiac poison:** Aconite acts on cardiac sodium channels, leading to arrhythmias and heart failure.
- **Asphyxiant:** Strychnine causes severe muscle spasms that can impair breathing, leading to asphyxiation.
- **Nephrotoxic:** Mercury damages renal tubules, impairing kidney function and leading to toxicity.

Quick Tip

Familiarize yourself with poisons categorized based on their primary organ or system of action.

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2. Match the following:

List-I	List-II
(A) Section 32, IEA	(I) Procedure of recording of Medical Evidence
(B) Section 45, IEA	(II) Dying declaration
(C) Section 138, IEA	(III) Part of Mental Health Act
(D) Section 136, IEA	(IV) Opinion of experts

Choose the correct option from the following:

(1) (A) - (II), (B) - (IV), (C) - (I), (D) - (III)

(2) (A) - (I), (B) - (III), (C) - (I), (D) - (IV)

(3) (A) - (II), (B) - (IV), (C) - (IV), (D) - (III)

(4) (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Correct Answer: (1) (A) - (II), (B) - (IV), (C) - (I), (D) - (III)

Solution:

- **Section 32, IEA:** Deals with the concept of dying declarations, which are statements made by a person on the verge of death, regarding the cause or circumstances of their impending death.
- **Section 45, IEA:** Refers to opinions of experts, such as medical or forensic experts, which are admissible in court to aid the judgment process.
- **Section 138, IEA:** Describes the procedure for recording medical evidence in court under cross-examination and re-examination.
- **Section 136, IEA:** Provides the court's discretion to decide the admissibility of evidence, including expert opinions.

Quick Tip

Learn the sections of the Indian Evidence Act (IEA) and their practical applications in legal and medical evidence.

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3. Match List-I with List-II:

List-I	List-II
(A) Laceration	(I) Sharp cutting force
(B) Exit wound	(II) Hard and blunt force
(C) Incision	(III) Inverted margins
(D) Entry wound	(IV) Everted margins

Choose the correct option from the following:

(1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

(2) (A) - (I), (B) - (I), (C) - (IV), (D) - (III)

(3) (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

(4) (A) - (III), (B) - (IV), (C) - (I), (D) - (III)

Correct Answer: (4) (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Solution:

- **Laceration:** Caused by blunt force, leading to irregular, torn skin edges.
- **Exit wound:** Exhibits everted margins due to outward pressure as a bullet exits the body.
- **Incision:** Created by a sharp object, producing clean and straight wound edges.
- **Entry wound:** Characterized by inverted margins due to the inward force of a bullet's entry.

Quick Tip

Associate wound characteristics with the type of force applied for forensic identification.

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4 . Density gradient of glass can be measured by:

(1) Benzene: Ethanol

(2) Bromoform: Ethanol

(3) Bromoform: Bromobenzene

(4) Bromobenzene: Alcohol

Correct Answer: (3) Bromoform: Bromobenzene

Solution:

The density gradient method is a precise technique for comparing glass fragments. Bromoform and Bromobenzene create a gradient due to their varying densities, allowing small differences in glass fragment densities to be detected. This method is widely used in forensic science.

Quick Tip

Memorize specific chemical combinations like Bromoform and Bromobenzene for forensic density analysis.

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5. Which of the following is not a man-made fiber?

(1) Nylon

(2) Vicuna

(3) Acrylic

(4) Polyester

Correct Answer: (2) Vicuna

Solution:

Vicuna is a natural fiber derived from the animal Vicuna, native to South America. It is known for its softness and rarity. Synthetic fibers like Nylon, Acrylic, and Polyester are man-made, developed through chemical processes for specific applications.

Quick Tip

Differentiate natural fibers from synthetic ones based on their origin and production method.

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6. Which of the following is not an example of depressants?

(1) Amphetamines

(2) Alcohol

(3) Diazepam

(4) Chlordiazepoxide

Correct Answer: (1) Amphetamines

Solution:

Amphetamines are classified as stimulants that increase central nervous system activity, boosting alertness and energy. Depressants like Alcohol, Diazepam, and Chlordiazepoxide, in contrast, slow down brain activity and induce relaxation or sedation.

Quick Tip

Categorize drugs by their effects on the nervous system to distinguish stimulants from depressants.

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7. Which of these is preferred as an antidote for opium poisoning?

(1) Naloxone

(2) Belladonna

(3) Atropine

(4) Nalorphine

Correct Answer: (1) Naloxone

Solution:

Naloxone acts as an opioid receptor antagonist, effectively reversing the respiratory depression caused by opium or opioid overdose. It is administered intravenously or intramuscularly and works rapidly to restore normal breathing.

Quick Tip

Naloxone is the go-to antidote for opioid-related emergencies, ensuring prompt reversal of life-threatening symptoms.

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8. Who invented DNA fingerprinting?

(1) Alec Jeffreys

(2) Kary Mullis

(3) Karl Landsteiner

(4) Edmond Locard

Correct Answer: (1) Alec Jeffreys

Solution:

Alec Jeffreys invented DNA fingerprinting in 1984. This innovation revolutionized forensic science by enabling the identification of individuals through their unique DNA patterns. It is widely used in criminal investigations, paternity testing, and genetic studies.

Quick Tip

Remember Alec Jeffreys as the pioneer of DNA fingerprinting in forensic science.

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9. Which of the following is responsible for the ”Run amok” condition?

(1) Opium

(2) Cannabis

(3) Cocaine

(4) Ethanol

Correct Answer: (2) Cannabis

Solution:

”Run amok” refers to a rare condition characterized by sudden, uncontrollable violent behavior. Cannabis has been associated with triggering such episodes in certain individuals due to its psychoactive effects. This is more likely in cases of high doses or underlying mental health vulnerabilities.

Quick Tip

Understand the psychotropic effects of cannabis and its potential to trigger rare behavioral conditions.

10. The cannabis product such as ganja is prepared from which part of the plant?

(1) Flowering tops

(2) Roots

(3) Stem

(4) Leaves

Correct Answer: (1) Flowering tops

Solution:

Ganja is derived from the flowering tops of the cannabis plant. These parts are rich in tetrahydrocannabinol (THC), the primary psychoactive compound. The flowering tops are processed to create products used for recreational or medicinal purposes.

Quick Tip

Focus on the flowering tops of the cannabis plant as the main source of THC-rich products like ganja.

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11. The autopsy is performed on:

(1) Intestine

(2) Head

(3) The whole body

(4) Only injured parts of the body

Correct Answer: (3) The whole body

Solution:

An autopsy, also known as a post-mortem examination, is performed on the whole body to identify the cause of death, document injuries, and evaluate any diseases that may have contributed to death. While certain injuries may be the primary focus, the comprehensive examination ensures that no evidence is overlooked, including internal and external observations, organ dissections, and toxicology testing.

Quick Tip

Always remember that an autopsy involves a full-body examination to ensure thorough forensic analysis and accurate conclusions.

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12. Which one of these is not included in the classification of hanging?

(1) Partial hanging

(2) Complete hanging

(3) Venous congestion

(4) Atypical hanging

Correct Answer: (3) Venous congestion

Solution:

Hanging is classified based on the position of the body and the ligature application, such as partial hanging (body partially suspended), complete hanging (entire body suspended), and atypical hanging (unusual ligature placement). Venous congestion refers to the pooling of blood in veins, which is a physiological or pathological effect observed during hanging but not a classification itself.

Quick Tip

Understand that hanging classifications are determined by body position and ligature type, while venous congestion is a secondary effect of the mechanism of death.

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13. Indented writing cannot be observed by:

(1) Naked eye

(2) ESDA

(3) Electrophoresis

(4) Microscopy

Correct Answer: (3) Electrophoresis

Solution:

Indented writing refers to impressions left on underlying pages when pressure is applied during writing. Techniques like Electrostatic Detection Apparatus (ESDA), microscopy, and sometimes the naked eye can detect such impressions. Electrophoresis, however, is a molecular biology technique used to separate molecules like DNA or proteins and is unrelated to document examination.

Quick Tip

For detecting indented writing, rely on tools like ESDA or magnification techniques, not molecular biology methods like electrophoresis.

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14. The medico-legal autopsy is done by the permission of:

(1) Magistrate

(2) Forensic serologist

(3) Relatives

(4) Medical officer

Correct Answer: (1) Magistrate

Solution:

A medico-legal autopsy is performed in cases of unnatural, suspicious, or unexplained deaths. The permission of a magistrate ensures legal compliance, allowing the autopsy to proceed as part of an official investigation. This process safeguards the rights of the deceased and ensures that evidence obtained is admissible in court. Relatives' consent is not mandatory in such cases.

Quick Tip

A magistrate's authorization is critical for conducting medico-legal autopsies in cases involving legal inquiries or criminal investigations.

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15. Latent fingerprints can be developed by:

(1) Neutron Activation Analysis

(2) Casting

(3) Electrophoresis

(4) Iodine fuming

Correct Answer: (4) Iodine fuming

Solution:

Latent fingerprints, which are invisible to the naked eye, are made visible using methods like iodine fuming. This technique involves exposing the surface to iodine vapors, which react with oils and sweat residues in the fingerprint, creating a temporary visual impression. Neutron Activation Analysis and casting are unrelated to fingerprint development.

Quick Tip

Use iodine fuming for developing latent fingerprints on porous surfaces like paper or cardboard.

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16. The pattern having two separate and distinct overlapping loops is known as:

(1) Twinned loop

(2) Lateral pocket loop

(3) Central pocket loop

(4) Accidental

Correct Answer: (1) Twinned loop

Solution:

A twinned loop is a unique fingerprint pattern where two separate loops overlap, with each loop having its distinct core. This pattern is less common and is categorized under composite fingerprint patterns.

Quick Tip

Familiarize yourself with composite fingerprint patterns like twinned loops for detailed forensic identification.

17. Which of the following is not a class characteristic of handwriting?

(1) Writing slant

(2) Form of allelographs

(3) Writing alignment

(4) Embellishments

Correct Answer: (4) Embellishments

Solution:

Class characteristics of handwriting include features shared by a group, such as slant, alignment, and letter formation. Embellishments, however, are unique to the individual writer and are considered individual characteristics, not class traits.

Quick Tip

Distinguish between class and individual characteristics in handwriting analysis for forensic purposes.

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18. The region of hair located between two layers containing pigment granules is known as:

(1) Cuticle

(2) Cortex

(3) Medulla

(4) Shaft

Correct Answer: (2) Cortex

Solution:

The cortex is the thickest layer of hair situated between the outermost cuticle and the innermost medulla. It contains pigment granules that determine the color of the hair. Additionally, the cortex provides tensile strength and flexibility to the hair due to its keratinized structure.

Quick Tip

The cortex is a critical region for analyzing hair structure and pigment distribution during forensic investigations.

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19. The contribution of Edmond Locard is regarding which of the following?

(1) Law of probability

(2) Law of progressive change

(3) Law of exchange

(4) Law of individuality

Correct Answer: (3) Law of exchange

Solution:

Edmond Locard's Exchange Principle asserts that "every contact leaves a trace." This principle is foundational in forensic science, as it emphasizes the transfer of material when two objects or individuals come into contact. These traces, such as fibers, hair, or fingerprints, can be crucial in linking suspects, victims, and crime scenes.

Quick Tip

Edmond Locard's Exchange Principle highlights the importance of trace evidence in solving crimes and reconstructing events.

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20. The process of reading or interpreting erased or obliterated material is known as:

(1) Decipherment

(2) Detection

(3) Efface

(4) Lithographic process

Correct Answer: (1) Decipherment

Solution:

Decipherment involves recovering erased or obliterated text using specialized forensic techniques. These include ultraviolet or infrared photography, chemical treatments, and other analytical methods. Decipherment is crucial for examining tampered documents, fraudulent claims, or historical artifacts.

Quick Tip

Master techniques like ultraviolet imaging and chemical treatments to excel in deciphering erased or obliterated writings.

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21. Which of the following is the sign of antemortem hanging?

(1) Lividity

(2) Algor mortis

(3) Dribbling of saliva

(4) Vomit

Correct Answer: (3) Dribbling of saliva

Solution:

Dribbling of saliva is a characteristic sign of antemortem hanging because it results from the compression of the salivary ducts by the ligature. This sign is observed only when the individual was alive at the time of hanging and is indicative of a physiological response to strangulation pressure.

Quick Tip

Dribbling of saliva is a physiological indicator specific to antemortem hanging, differentiating it from postmortem scenarios.

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22. In respect to PCR technique, in a degraded biological sample, the longer the amplicon length:

(1) The higher the risk of failure in PCR

(2) The lowest the risk of failure in PCR

(3) The higher the risk of disturbing coding region

(4) The higher temperature is required to get better results

Correct Answer: (1) The higher the risk of failure in PCR

Solution:

Degraded DNA samples often contain fragmented DNA strands. PCR amplification relies on intact template strands, and the longer the amplicon length, the higher the probability of template failure. For degraded DNA, short amplicon targets (e.g., miniSTRs) are often used to ensure successful amplification despite template degradation.

Quick Tip

When working with degraded samples, design primers for shorter amplicons to improve the likelihood of successful PCR amplification.

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23. To prevent contamination during setup of PCR reaction, which one of these is not important?

(1) Pre- and post-PCR samples should be processed in separate areas

(2) Equipment used for pre- and post-PCR steps should be cleaned after every use

(3) Reagents used for pre- and post-PCR steps should be separated

(4) Adding smaller amounts of Bovine Serum Albumin (BSA) is avoided

Correct Answer: (4) Adding smaller amounts of Bovine Serum Albumin (BSA) is avoided

Solution:

BSA is often added to PCR reactions to stabilize enzymes and improve efficiency, but it does not prevent contamination. Preventing contamination requires physical separation of pre- and post-PCR areas, cleaning equipment, and separating reagents. BSA is unrelated to contamination control.

Quick Tip

Focus on physical barriers, proper equipment cleaning, and reagent management to maintain a contamination-free PCR setup.

24. In which of the following, the Takayama reagent gives positive results?

(1) Saliva stain

(2) Urine stain

(3) Blood stain

(4) Vaginal stain

Correct Answer: (3) Blood stain

Solution:

The Takayama test is a confirmatory test for the presence of blood. It detects hemoglobin by forming characteristic hemochromogen crystals in a positive reaction. This test is used to confirm the identity of bloodstains found at crime scenes.

Quick Tip

The Takayama test is a reliable confirmatory method to identify blood presence in forensic investigations.

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25. Arrange the following in chronological order:

(1) (C), (D), (A), (B)

(2) (A), (B), (C), (D)

(3) (B), (A), (D), (C)

(4) (C), (B), (D), (A)

Correct Answer: (1) (C), (D), (A), (B)

Solution:

The correct chronological order represents the evolution of firearms: Matchlock (C), Wheel lock (D), Snaphaunce (A), and Flintlock (B). Understanding the development of firearms is essential for firearm identification in forensic analysis.

Quick Tip

Chronologically understanding firearm advancements helps in accurate forensic identification and historical context.

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26. Which among the following does not fall under the category of unnatural sexual offences?

(1) Sodomy

(2) Incest

(3) Bestiality

(4) Buccal coitus

Correct Answer: (2) Incest

Solution:

Incest is considered a moral or societal offence rather than an unnatural sexual offence. Unnatural sexual offences typically involve acts against the order of nature, such as sodomy, bestiality, and buccal coitus, which are classified under specific legal provisions.

Quick Tip

Understand the distinction between moral offences and unnatural sexual offences to apply legal classifications appropriately.

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27. Arrange the following steps chronologically to be followed at a scene of crime (SOC):

(A) Collection of evidences

(B) Securing of SOC

(C) Photography and videography

(D) Packaging of evidences

(1) (A), (B), (C), (D)

(2) (B), (C), (A), (D)

(3) (B), (A), (D), (C)

(4) (C), (B), (D), (A)

Correct Answer: (2) (B), (C), (A), (D)

Solution:

The proper sequence begins with securing the crime scene to prevent contamination (B), followed by documentation through photography and videography (C). Evidence is then collected systematically (A) and finally packaged appropriately to maintain its integrity (D).

Quick Tip

A systematic approach to crime scene management ensures evidence preservation and reliability in legal proceedings.

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28. Teaching of Forensic Science subject was first started in which of these places?

(1) Chandigarh

(2) Sagar, M.P.

(3) Delhi

(4) Mumbai

Correct Answer: (2) Sagar, M.P.

Solution:

Sagar University, located in Madhya Pradesh, was the first institution in India to introduce the teaching of forensic science as an academic subject. This marked the beginning of formal education in this field, contributing to the development of forensic expertise in the country.

Quick Tip

Sagar University's pioneering role in forensic science education highlights its importance in shaping forensic advancements in India.

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29. In HPLC, when the packing material used in the column is polar in nature and the mobile phase is relatively non-polar, it is known as:

(1) Normal phase

(2) Reverse phase

(3) Neutral phase

(4) Stationary phase

Correct Answer: (1) Normal phase

Solution:

Normal phase chromatography utilizes a polar stationary phase and a non-polar mobile phase. It is primarily used for separating compounds based on their polarity, with polar compounds being retained longer due to their stronger interaction with the stationary phase.

Quick Tip

Understand phase polarity in HPLC to choose the correct method for analyzing chemical mixtures.

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30. Which of these is not a fingerprint pattern?

(1) Whorl

(2) Arch

(3) Loop

(4) Ridge

Correct Answer: (4) Ridge

Solution:

Ridges are the structural features of fingerprints, not a specific pattern. The three primary fingerprint patterns are whorls, arches, and loops, which are used in forensic analysis for classification and identification.

Quick Tip

Focus on patterns like whorls, arches, and loops for classifying fingerprints, as ridges describe their physical structure.

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31. Which one of these is another term for an invisible fingerprint found at the scene of crime?

(1) Latent fingerprint

(2) Blood smeared fingerprint

(3) Plastic fingerprint

(4) Greased fingerprint

Correct Answer: (1) Latent fingerprint

Solution:

Latent fingerprints are invisible to the naked eye and require special techniques, such as dusting powders, chemical reagents, or light sources, to make them visible. They are formed by the natural oils and sweat from the skin and are commonly found at crime scenes.

Quick Tip

Latent fingerprints are crucial in forensic investigations and often require enhancement techniques for visibility.

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32. Sodium chloride present in latent fingerprints reacts with which of the following to produce visible prints?

(1) Grey powder

(2) Silver nitrate

(3) Ninhydrin

(4) Super glue

Correct Answer: (2) Silver nitrate

Solution:

Silver nitrate reacts with the sodium chloride present in sweat residues of latent fingerprints to form silver chloride. Upon exposure to ultraviolet light, the silver chloride darkens, making the fingerprint visible. This method is particularly useful on porous surfaces.

Quick Tip

Use silver nitrate for latent fingerprint development on surfaces with high chloride residues, like paper.

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33. Starch iodine test can be performed for which of the following body fluids?

(1) Blood

(2) Urine

(3) Saliva

(4) Vaginal discharge

Correct Answer: (3) Saliva

Solution:

The starch iodine test detects the presence of amylase, an enzyme found in saliva. Amylase breaks down starch, and the absence of a blue-black coloration indicates enzymatic activity, confirming the presence of saliva.

Quick Tip

The starch iodine test is an effective presumptive test for saliva detection in forensic cases.

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34. Which of the following are examples of natural fibers?

(A) Wool

(B) Cotton

(C) Rayon

(D) Mohair

(1) (A), (B), and (C) only

(2) (A), (B), and (D) only

(3) (A), (C), and (D) only

(4) (B), (C), and (D) only

Correct Answer: (2) (A), (B), and (D) only

Solution:

Natural fibers are derived from plants and animals. Wool, cotton, and mohair are natural fibers, while rayon is a man-made or semi-synthetic fiber created from cellulose.

Quick Tip

Classify fibers based on their origin, distinguishing natural fibers from synthetic ones like rayon.

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35. A deliberate attempt to alter usual handwriting habits in hopes of hiding identity is known as:

(1) Disguise writing

(2) Manuscript writing

(3) Guided writing

(4) Forged writing

Correct Answer: (1) Disguise writing

Solution:

Disguise writing involves an intentional change in handwriting patterns to obscure identity or prevent recognition. This technique is commonly used by individuals attempting to hide their usual handwriting in fraudulent or criminal activities.

Quick Tip

Disguise writing is identified by inconsistent letter forms or unnatural handwriting habits during forensic analysis.

36. The separation of a mixture of proteins by placing them on a gel-coated plate under the influence of an electric potential is:

(1) Electrophoresis

(2) Polymerase chain reaction

(3) Micrography

(4) X-ray diffraction

Correct Answer: (1) Electrophoresis

Solution:

Electrophoresis separates molecules, such as proteins or nucleic acids, based on their charge and size under an electric field. This method is essential for analyzing complex mixtures in molecular biology and forensic science.

Quick Tip

Electrophoresis is critical for separating and characterizing proteins and DNA in forensic and biological studies.

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37. Skid marks can be used to determine:

(1) Type of vehicle

(2) Speed of vehicle

(3) Colour of vehicle

(4) Height of vehicle

Correct Answer: (2) Speed of vehicle

Solution:

Skid marks are the result of braking and tire-road friction. Analyzing the length and pattern of skid marks helps in estimating the vehicle's speed during braking and contributes to accident reconstruction.

Quick Tip

Skid marks provide valuable data for reconstructing vehicle speeds in traffic accidents.

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38. Seminal fluid stain is identified by:

(1) Acid phosphatase test

(2) Starch iodine test

(3) Teichmann test

(4) Benzidine test

Correct Answer: (1) Acid phosphatase test

Solution:

The acid phosphatase test detects high levels of acid phosphatase enzyme in seminal fluid. A positive result involves a color change, making it a presumptive test for identifying seminal stains in forensic investigations.

Quick Tip

The acid phosphatase test is an essential initial step in analyzing suspected seminal stains.

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39. A writing weakness reflected by shaky and irregular strokes is termed as:

(1) Tremor

(2) Embellishment

(3) Slant

(4) Rhythm

Correct Answer: (1) Tremor

Solution:

Tremors in handwriting are characterized by shaky, irregular strokes caused by factors like nervousness, physical conditions, or lack of control. Forensic handwriting analysis examines

these traits to deduce possible influences on the writer.

Quick Tip

Tremors in handwriting can indicate stress, health issues, or deliberate attempts to alter writing style.

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40. In postmortem drowning cases, diatoms are mainly found in:

(1) Sternum

(2) Femur

(3) Liver

(4) Stomach

Correct Answer: (2) Femur

Solution:

Diatoms are microscopic algae that enter the bloodstream in drowning cases. They travel through the circulatory system and get deposited in the bone marrow, such as the femur. Their presence helps confirm drowning as the cause of death.

Quick Tip

Diatom analysis in femur bone marrow is a reliable method for confirming drowning in forensic investigations.

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41. The smearing over the writing to make the original undecipherable is known as:

(1) Restoration

(2) Obliteration

(3) Erasure

(4) Separation

Correct Answer: (2) Obliteration

Solution:

Obliteration involves smearing, overwriting, or altering text to make it unreadable. This is often done in attempts to destroy evidence or hide original content. Forensic techniques such as infrared and ultraviolet imaging can help recover obliterated writings.

Quick Tip

Use forensic light sources like UV or IR to reveal obliterated text in document analysis.

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42. A photograph made through a compound microscope and may be greatly enlarged image of a small area, is known as:

(1) Microphotograph

(2) Photomicrograph

(3) Projection prints

(4) Photostats

Correct Answer: (2) Photomicrograph

Solution:

A photomicrograph is a photograph taken using a microscope to magnify details that are invisible to the naked eye. It is extensively used in forensic science to document minute features of evidence like fibers, tissues, or microorganisms.

Quick Tip

Photomicrographs provide detailed insights into microscopic evidence critical for forensic investigations.

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43. Which of the separation techniques is best suited for the analysis of alcohol in blood?

(1) Pyrolytic GC

(2) Low temperature GC

(3) Headspace GC

(4) Capillary GC

Correct Answer: (3) Headspace GC

Solution:

Headspace Gas Chromatography (GC) is a specialized technique for analyzing volatile compounds such as alcohol in biological samples. It minimizes contamination by isolating the volatile substances in a sealed system, making it highly reliable for forensic toxicology.

Quick Tip

Headspace GC is the gold standard for detecting alcohol levels in blood samples in forensic analysis.

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44. Which of the following characteristics are observed in complete close contact wound from a shotgun?

(A) Muzzle impression

(B) Tattooing

(C) Seared zone

(D) Blackened zone

(1) (A) and (B) only

(2) (B) and (D) only

(3) (A) and (C) only

(4) (C) and (D) only

Correct Answer: (3) (A) and (C) only

Solution:

In complete close contact wounds, the muzzle of the firearm leaves an impression on the skin, and the heat from the gases sears the tissues, creating a seared zone. These features are unique to such wounds and aid in forensic analysis.

Quick Tip

Close contact wounds often show distinctive features like muzzle impressions and seared zones due to heat and gas discharge.

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45. Interruption in the strokes due to the removal of the writing instrument is known as:

(1) Pen pressure

(2) Pen lift

(3) Retouching

(4) Pen emphasis

Correct Answer: (2) Pen lift

Solution:

A pen lift occurs when the writing instrument is temporarily removed from the surface, causing an interruption in the strokes. This feature is analyzed in forensic handwriting examination to identify writing habits or detect forgeries.

Quick Tip

Pen lifts in handwriting can reveal natural pauses or intentional breaks, aiding in forgery detection.

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46. The loop pattern flowing towards the thumb of that hand is known as:

(1) Ulnar loop

(2) Radial loop

(3) Double loop

(4) Central loop

Correct Answer: (2) Radial loop

Solution:

A radial loop is a fingerprint pattern that opens toward the thumb side of the hand. This classification is based on the flow direction relative to the radius bone, making it distinct from ulnar loops that flow toward the little finger.

Quick Tip

Radial loops open towards the thumb and are named based on their relation to the radius bone.

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47. AFIS is the abbreviation used for:

(1) All Finger Index System

(2) Automated Fingerprint International Standard

(3) Automated Finger Index System

(4) Automated Fingerprint Identification System

Correct Answer: (4) Automated Fingerprint Identification System

Solution:

AFIS stands for Automated Fingerprint Identification System. It is a computerized system used to store, search, and match fingerprint data efficiently. This technology is critical in modern forensic investigations for rapid identification.

Quick Tip

AFIS enhances the accuracy and speed of fingerprint matching in forensic and law enforcement applications.

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48. In alcohols, which type of hybridization is associated with the carbon atom to which the hydroxyl group (OH) is connected?

(1) sp^3 hybridization

(2) sp^2 hybridization

(3) spd^2 hybridization

(4) sp hybridization

Correct Answer: (1) sp^3 hybridization

Solution:

In alcohols, the carbon atom attached to the hydroxyl group (OH) undergoes sp^3 hybridization. This arrangement results in a tetrahedral geometry, with the hydroxyl group and three other substituents bonded to the carbon atom.

Quick Tip

The sp^3 hybridization in alcohols ensures tetrahedral geometry, crucial for their chemical properties.

---

49. The book called "Fingerprint" was written by:

(1) Alphonse Bertillon

(2) Francis Galton

(3) Karl Landsteiner

(4) Edmond Locard

Correct Answer: (2) Francis Galton

Solution:

Francis Galton authored the book "Fingerprint," which laid the foundation for the scientific study and classification of fingerprints. His work highlighted the uniqueness of fingerprints, making them a vital tool in personal identification and forensic science.

Quick Tip

Francis Galton's contributions revolutionized fingerprint analysis and established its role in forensic science.

---

50. The scientific name of marking nut is:

(1) Claviceps purpurea

(2) Capsicum annuum

(3) Semecarpus anacardium

(4) Azadirachta indica

Correct Answer: (3) Semecarpus anacardium

Solution:

The marking nut, known for its medicinal and toxicological properties, is scientifically named Semecarpus anacardium. It has been used in traditional medicine and forensic investigations due to its characteristic staining property.

Quick Tip

Semecarpus anacardium, the marking nut, is notable for its applications in traditional medicine and forensic science.

---

51. An unknown compound 'A' has a molecular formula C_4H_6. When 'A' is treated with excess Br_2, a new substance 'B' with molecular formula $C_4H_8Br_2$ is formed. The unknown compound 'A' when reacted with ammonical silver nitrate solution forms a white precipitate. The unknown compound 'A' could be:

(1) But-1-yne

(2) But-2-yne

(3) But-1-ene

(4) But-2-ene

Correct Answer: (1) But-1-yne

Solution:

The molecular formula C_4H_6 corresponds to an alkyne. The reaction with ammonical silver nitrate indicates the presence of a terminal alkyne group, which reacts to form a precipitate. Among the options, But-1-yne is the only terminal alkyne that matches the given conditions.

Quick Tip

Terminal alkynes react with $AgNO_3$ in ammoniacal solution to form a white precipitate due to silver acetylide formation.

52. What is the refractive index of water at $25^{\circ}C$?

(1) 1.450

(2) 1.256

(3) 1.822

(4) 1.333

Correct Answer: (4) 1.333

Solution:

The refractive index of water at room temperature ($25^{\circ}C$) is a standard value of 1.333. This value indicates the ratio of the speed of light in a vacuum to its speed in water. It is a fundamental property used in optical experiments and calculations.

Quick Tip

The refractive index of water is critical for calculating light refraction in optics and laboratory experiments.

---

53. Which of the following has no charge?

(1) Proton

(2) Neutron

(3) Electron

(4) Anion

Correct Answer: (2) Neutron

Solution:

The neutron is a subatomic particle found in the nucleus of an atom, along with protons. Unlike protons, which are positively charged, and electrons, which are negatively charged, neutrons have no electrical charge, making them neutral particles.

Quick Tip

Neutrons are neutral particles that contribute to atomic mass but not electrical charge.

---

54. The study of hair is known as:

(1) Histology

(2) Palynology

(3) Trichology

(4) Hematology

Correct Answer: (3) Trichology

Solution:

Trichology is the branch of science concerned with the structure, function, and diseases of human hair and scalp. It is used in forensic science to analyze hair for evidence, such as determining its origin or identifying the presence of toxins.

Quick Tip

Trichology plays a key role in forensic investigations by analyzing hair samples for clues about identity or health.

---

55. The following characteristics are peculiar to ballpen writings:

(1) (A) and (B) only

(2) (B) and (C) only

(3) (C) and (D) only

(4) (D) and (A) only

Correct Answer: (1) (A) and (B) only

Solution:

Ballpen writings typically exhibit characteristics such as darker double tracks within strokes and burr striations. These features are caused by the rolling mechanism of the ball in the pen,

which deposits ink unevenly.

Quick Tip

Identify ballpen writings by their unique features, such as double tracks and burr striations.

---

56. The National Forensic DNA Database maintained by the FBI is known as:

(1) AFIS

(2) CODIS

(3) ISIA

(4) DOPA

Correct Answer: (2) CODIS

Solution:

CODIS (Combined DNA Index System) is a software platform developed by the FBI for storing and comparing DNA profiles. It facilitates the matching of DNA from crime scenes with profiles in the database to identify suspects.

Quick Tip

CODIS enables law enforcement agencies to share and compare DNA profiles efficiently for solving crimes.

---

57. Rh factor was discovered by:

(1) Landsteiner

(2) Mendel

(3) Hugo

(4) Pearson

Correct Answer: (1) Landsteiner

Solution:

Karl Landsteiner, along with Alexander Wiener, discovered the Rh factor in 1940. This antigen, present on the surface of red blood cells, determines the Rh-positive or Rh-negative status of blood groups, which is critical for blood transfusions and pregnancy.

Quick Tip

The Rh factor plays a crucial role in blood compatibility, especially during transfusions and pregnancies.

---

58. Match List-I with List-II:

List-I (Instrument)	**List-II (Evidence)**
(A) Microscope	(I) Indented writing
(B) Comparison Microscope	(II) Fiber
(C) ESDA	(III) Fired bullets
(D) TLC	(IV) Ink

Choose the correct option from the following:

(1) (A) - (I), (B) - (II), (C) - (IV), (D) - (II)

(2) (A) - (I), (B) - (II), (C) - (I), (D) - (IV)

(3) (A) - (I), (B) - (I), (C) - (I), (D) - (IV)

(4) (A) - (II), (B) - (IV), (C) - (I), (D) - (III)

Correct Answer: (2) (A) - (I), (B) - (II), (C) - (I), (D) - (IV)

Solution:

Each instrument corresponds to specific forensic evidence. A microscope is used to analyze indented writing, a comparison microscope examines fibers, ESDA (Electrostatic Detection Apparatus) detects indented writing, and TLC (Thin Layer Chromatography) is used for ink analysis.

Quick Tip

Understanding the specific applications of forensic tools ensures accurate evidence analysis.

59. Which of the following tests is based on hemoglobin activity?

(1) Kastle Meyer test

(2) Silver nitrate

(3) Choline test

(4) Starch iodine test

Correct Answer: (1) Kastle Meyer test

Solution:

The Kastle Meyer test is a presumptive test for blood detection. It relies on the peroxidase-like activity of hemoglobin to catalyze the oxidation of phenolphthalein, resulting in a pink color change. This test is widely used in forensic cases for rapid blood identification.

Quick Tip

The Kastle Meyer test is a fast, reliable method to identify blood in forensic investigations.

---

60. In which of the following, the recombinant DNA relies on to cut DNA into fragments?

(1) Dimers

(2) DNTPs

(3) Primers

(4) Restriction Enzyme

Correct Answer: (4) Restriction Enzyme

Solution:

Restriction enzymes are specialized proteins that recognize specific DNA sequences and cut at or near these sites. They are essential tools in recombinant DNA technology for generating DNA fragments used in cloning, sequencing, and analysis.

Quick Tip

Restriction enzymes are molecular scissors used to manipulate DNA in genetic engineering and forensic applications.

---

61. The instrument that automates the rapid and precise temperature changes required to copy a DNA strand is:

(1) Centrifuge

(2) Thermal cycler

(3) Incubator

(4) Vortex

Correct Answer: (2) Thermal cycler

Solution:

The thermal cycler, or PCR machine, is a device that cycles through the precise temperatures needed for DNA amplification. It is indispensable in molecular biology for processes like DNA replication, sequencing, and forensic analyses.

Quick Tip

Thermal cyclers are essential for efficient and accurate DNA amplification in molecular biology.

---

62. Match List-I with List-II:

List-I	**List-II**
(A) Cherry red	(I) Potassium chlorate poisoning
(B) Bright pink	(II) Carbon monoxide poisoning
(C) Dark brown or yellow	(III) Phosphorous poisoning
(D) Chocolate	(IV) Refrigerated body

Choose the correct option from the following:

(1) (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

(2) (A) - (I), (B) - (I), (C) - (I), (D) - (IV)

(3) (A) - (I), (B) - (II), (C) - (IV), (D) - (III)

(4) (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Correct Answer: (1) (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Solution:

Each post-mortem staining color relates to specific poisoning or preservation conditions: Cherry red indicates carbon monoxide poisoning, bright pink occurs in refrigerated bodies, dark brown or yellow is associated with potassium chlorate poisoning, and chocolate indicates phosphorus poisoning.

Quick Tip

Recognize post-mortem staining patterns to link death to specific toxic exposures or conditions.

---

63. The chemical technique utilized for the development of latent prints on non-porous surfaces is:

(1) Takayama test

(2) Elution technique

(3) Super glue fuming

(4) Walker test

Correct Answer: (3) Super glue fuming

Solution:

Super glue fuming, or cyanoacrylate fuming, is a widely used forensic technique for visualizing latent fingerprints on non-porous surfaces like metal, plastic, and glass. The cyanoacrylate vapor polymerizes on the fingerprint residues, creating a visible white print.

Quick Tip

Super glue fuming is ideal for non-porous surfaces, providing a clear and durable fingerprint impression.

64. Match the following:

List-I	List-II
(A) If two writings are by a single person	(I) No fundamental differences should exist
(B) Personal peculiarities, many of them in inconspicuous details	(II) Constitute the backbone of an identification
(C) Class characteristics	(III) Result from influences such as the writing system
(D) Individual characteristics	(IV) Distinguish the writings of two persons

Choose the correct option from the following:

(1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

(2) (A) - (II), (B) - (III), (C) - (I), (D) - (IV)

(3) (A) - (III), (B) - (IV), (C) - (II), (D) - (I)

(4) (A) - (I), (B) - (IV), (C) - (III), (D) - (II)

Correct Answer: (1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

Solution:

The matching is based on handwriting principles: Class characteristics link groups, individual traits provide unique identification, and peculiarities enhance discrimination between writings.

Quick Tip

Understand class and individual handwriting features for accurate forensic document analysis.

65. The ratio of the speed of light in a vacuum to its speed in a given substance is:

(1) Reflection index

(2) Medullary index

(3) Refractive index

(4) Reflux index

Correct Answer: (3) Refractive index

Solution:

The refractive index measures how much light bends or slows down as it enters a medium. It is crucial in forensic glass analysis to compare refractive properties of glass fragments at crime scenes.

Quick Tip

Refractive index comparisons help match glass fragments to their source in forensic cases.

---

66. Match List-I with List-II:

List-I	**List-II**
(A) Chop wound	(I) Axe
(B) Punctured wound	(II) Needle
(C) Bruises	(III) Whip
(D) Incised wound	(IV) Knife

Choose the correct option from the following:

(1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

(2) (A) - (IV), (B) - (III), (C) - (II), (D) - (I)

(3) (A) - (II), (B) - (III), (C) - (IV), (D) - (I)

(4) (A) - (III), (B) - (II), (C) - (I), (D) - (IV)

Correct Answer: (1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

Solution:

Different types of wounds correlate with specific instruments or causes. Chop wounds result from axes, punctured wounds from needles, bruises from whips, and incised wounds from

knives. These associations aid forensic experts in deducing the cause of injuries.

Quick Tip

Link wound types to specific tools or actions for accurate injury analysis in forensic investigations.

---

67. The type of protein that acts as a catalyst for certain specific reactions is:

(1) Enzyme

(2) Lactose

(3) Cellulose

(4) Fructose

Correct Answer: (1) Enzyme

Solution:

Enzymes are biological catalysts that accelerate chemical reactions without being consumed in the process. They are specific to the reactions they catalyze, such as digestion, DNA replication, and energy production.

Quick Tip

Enzymes are crucial in forensic toxicology for detecting and analyzing metabolic reactions.

---

68. Match List-I with List-II:

List-I (Phenotype)	**List-II (Antibodies)**
(A) O	(I) Anti-A and Anti-B
(B) A	(II) Anti-B
(C) B	(III) Anti-A
(D) AB	(IV) None

Choose the correct option from the following:

(1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

(2) (A) - (I), (B) - (III), (C) - (II), (D) - (IV)

(3) (A) - (IV), (B) - (I), (C) - (III), (D) - (II)

(4) (A) - (I), (B) - (II), (C) - (IV), (D) - (III)

Correct Answer: (2) (A) - (I), (B) - (III), (C) - (II), (D) - (IV)

Solution:

Phenotypes correspond to specific antibodies: O produces Anti-A and Anti-B, A produces Anti-B, B produces Anti-A, and AB produces no antibodies. This knowledge is critical in blood typing for transfusions.

Quick Tip

Blood typing based on antigen-antibody interactions is vital in transfusion medicine and forensic science.

---

69. Match List-I with List-II:

List-I (Branches)	**List-II (Study area)**
(A) Podogram	(I) Footprints
(B) Cheiloscopy	(II) Lip prints
(C) Palatoscopy	(III) Palatal rugae
(D) Dactylography	(IV) Fingerprints

Choose the correct option from the following:

(1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

(2) (A) - (II), (B) - (III), (C) - (I), (D) - (IV)

(3) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

(4) (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Correct Answer: (3) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

Solution:

Each forensic branch is associated with a unique study area: Podogram studies footprints, Cheiloscopy studies lip prints, Palatoscopy studies palatal rugae, and Dactylography studies fingerprints.

Quick Tip

Associating forensic branches with their applications is key to accurate evidence interpretation.

---

70. Which of the following tire marks are created when the tire rotates while simultaneously turning?

(1) Skid marks

(2) Tread marks

(3) Acceleration marks

(4) Yaw marks

Correct Answer: (4) Yaw marks

Solution:

Yaw marks are curved tire marks caused when a vehicle slides sideways while still moving forward. These marks indicate a loss of control and are often used in accident reconstruction to determine the vehicle's speed and path.

Quick Tip

Yaw marks provide critical clues in reconstructing vehicle dynamics during accidents.

---

71. What is the full form of FIR?

(1) First Investigation Report

(2) First Information Representor

(3) First Information Report

(4) First Information Request

Correct Answer: (3) First Information Report

Solution:

The First Information Report (FIR) is a written document prepared by police when they receive information about the commission of a cognizable offense. It is the initial step in initiating an investigation and serves as a formal record of the complaint or information received.

Quick Tip

FIR is critical for initiating criminal investigations and must be filed promptly to ensure proper legal proceedings.

---

72. Which of the following tire tread characteristics does not belong to the tire tread nomenclature?

(1) Sipes

(2) Furls

(3) Grooves

(4) Ribs

Correct Answer: (2) Furls

Solution:

Furls are not a recognized characteristic of tire treads. Common tire tread features include sipes (small slits for better grip), grooves (channels for water dispersion), and ribs (raised portions for stability). These features are essential for analyzing tire impressions in forensic investigations.

Quick Tip

Tire tread analysis helps match vehicles to crime scenes and identify tire brands.

---

73. Which of the following has the highest alcohol percentage?

(1) Wine

(2) Rum

(3) Champagne

(4) Beer

Correct Answer: (2) Rum

Solution:

Rum typically contains a higher alcohol content, ranging from 40% to 60%, compared to wine (10–15%), champagne (12–14%), and beer (4–6%). This makes rum a distilled beverage with a significantly higher alcohol percentage.

Quick Tip

Distilled beverages like rum have higher alcohol content than fermented ones like beer or wine.

---

74. Match List-I with List-II:

List-I (Scientific Name)	**List-II (Vegetable Poison)**
(A) Ricinus communis	(I) Jamalgota
(B) Croton tiglium	(II) Dhobis nut
(C) Semecarpus anacardium	(III) Lal mirch
(D) Capsicum annuum	(IV) Arandi

Choose the correct option from the following:

(1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

(2) (A) - (IV), (B) - (I), (C) - (II), (D) - (III)

(3) (A) - (III), (B) - (II), (C) - (IV), (D) - (I)

(4) (A) - (IV), (B) - (I), (C) - (III), (D) - (II)

Correct Answer: (2) (A) - (IV), (B) - (I), (C) - (II), (D) - (III)

Solution:

The scientific names correspond to specific vegetable poisons: Ricinus communis (Arandi), Croton tiglium (Jamalgota), Semecarpus anacardium (Dhobis nut), and Capsicum annuum (Lal mirch). Understanding these associations is crucial in forensic toxicology.

Quick Tip

Familiarize yourself with scientific names of toxic plants and their associated poisons for forensic applications.

---

75. Match the following with their active principle component:

List-I (Plant)	**List-II (Active Principle)**
(A) Oleander	(I) Nerin
(B) Betel Nut	(II) Arecoline
(C) Aconite	(III) Pseudaconitine
(D) Tobacco	(IV) Nicotine

Choose the correct option from the following:

(1) (A) - (I), (B) - (III), (C) - (IV), (D) - (II)

(2) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

(3) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

(4) (A) - (III), (B) - (I), (C) - (IV), (D) - (II)

Correct Answer: (3) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

Solution:

The active principles of these plants are Oleander (Nerin), Betel Nut (Arecoline), Aconite (Pseudaconitine), and Tobacco (Nicotine). These principles are key for identifying toxic effects in forensic toxicology.

Quick Tip

Active principles help forensic toxicologists identify plant-based toxins in investigations.
