

CUET PG Forensic Science 28th March 2024 Shift 1

Time Allowed :1 Hour 45 Minutes

Maximum Marks :300

Total Questions :75

General Instructions

Read the following instructions very carefully and strictly follow them:

1. This question paper comprises **75 questions**. All questions are compulsory.
2. Each question carries **04 (four) marks**.
3. For each correct response, the candidate will get **04 (four) marks**.
4. For each incorrect response, **01 (one) mark** will be deducted from the total score.
5. **Un-answered/un-attempted responses** will be given **no marks**.
6. To answer a question, the candidate needs to choose **one option as the correct option**.
7. However, after the process of **Challenges of the Answer Key**, in case there are multiple correct options or a change in the key, only those candidates who have attempted it correctly as per the **revised Final Answer Key** will be awarded marks.
8. In case a question is **dropped due to some technical error**, full marks shall be given to all the candidates irrespective of whether they have attempted it or not.

Question 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

Options:

- (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 corresponds to Carbon monoxide, which affects the central nervous system.
- Cardiac poison refers to Aconite, known for its effects on heart rhythms.
- Asphyxiants include Strychnine, which affects breathing by causing muscle spasms.
- Nephrotoxic substances like Mercury damage the kidneys.

Quick Tip

Understand the toxicological effects of different poisons and their classifications.

Question 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

Options:

- (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:

- Lacerations are caused by hard and blunt force, resulting in irregular wounds.
- Exit wounds often have everted margins, indicating the direction of bullet travel.
- Incisions result from sharp cutting forces.
- Entry wounds typically show inverted margins, indicative of bullet entry.

Quick Tip

Differentiate between wound types based on force applied and wound characteristics.

Question 4.

Density gradient of glass can be measured by:

Options:

- (1) Benzene: Ethanol

- (2) Bromoform: Ethanol
- (3) Bromoform: Bromobenzene
- (4) Bromobenzene: Alcohol

Correct Answer: (3) Bromoform: Bromobenzene

Solution:

The density gradient method uses a combination of Bromoform and Bromobenzene due to their ability to create precise density ranges for matching glass fragments.

Quick Tip

Learn the specific combinations used in density gradient analysis for glass identification.

Question 5.

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

Options:

- (1) Nylon
- (2) Vicuna
- (3) Acrylic
- (4) Polyester

Correct Answer: (2) Vicuna

Solution:

Vicuna is a natural fiber obtained from the Vicuna animal, unlike synthetic fibers such as Nylon, Acrylic, and Polyester.

Quick Tip

Understand the classification of fibers based on their origin: natural vs synthetic.

Question 6.

Which of the following is not an example of depressants?

Options:

- (1) Amphetamines
- (2) Alcohol
- (3) Diazepam
- (4) Chlordiazepoxide

Correct Answer: (1) Amphetamines

Solution:

Amphetamines are stimulants that increase alertness and energy, unlike depressants such as Alcohol, Diazepam, and Chlordiazepoxide, which reduce central nervous system activity.

Quick Tip

Differentiate stimulants from depressants based on their effects on the central nervous system.

Question 7.

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

Options:

- (1) Naloxone
- (2) Belladonna
- (3) Atropine
- (4) Nalorphine

Correct Answer: (1) Naloxone

Solution:

Naloxone is a competitive opioid antagonist that is effective in reversing the effects of opium poisoning. Other options like Atropine and Nalorphine are not specific antidotes for opium.

Quick Tip

Use Naloxone as the first-line treatment in cases of opioid or opium poisoning.

Question 8.

Who invented DNA fingerprinting?

Options:

- (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, revolutionizing forensic science by enabling the identification of individuals through their unique DNA profiles.

Quick Tip

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

Question 9.

Which of the following is responsible for the "Run amok" condition?

Options:

- (1) Opium
- (2) Cannabis
- (3) Cocaine
- (4) Ethanol

Correct Answer: (2) Cannabis

Solution:

Cannabis can sometimes lead to "Run amok," a sudden and violent behavior outbreak due to its psychotropic effects, especially in individuals prone to such conditions.

Quick Tip

Recognize cannabis-induced psychosis as a rare but notable condition linked to violent behavior.

Question 10.

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

Options:

- (1) Flowering tops
- (2) Roots
- (3) Stem
- (4) Leaves

Correct Answer: (1) Flowering tops

Solution:

Ganja is prepared from the flowering tops of the cannabis plant, which contain a high concentration of tetrahydrocannabinol (THC), the psychoactive compound in cannabis.

Quick Tip

Focus on the flowering tops of cannabis plants as the source of psychoactive products like ganja.

Question 11.

The autopsy is performed on:

Options:

- (1) Intestine
- (2) Head
- (3) The whole body
- (4) Only injured parts of body

Correct Answer: (3) The whole body

Solution:

An autopsy involves the examination of the whole body to determine the cause of death, extent of injuries, or any underlying diseases.

Quick Tip

Autopsies are thorough examinations, covering the entire body, for accurate forensic analysis.

Question 12.

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

Options:

- (1) Partial hanging
- (2) Complete hanging
- (3) Venous congestion
- (4) Atypical hanging

Correct Answer: (3) Venous congestion

Solution:

Venous congestion is a pathological condition and not a classification of hanging, which includes partial, complete, and atypical hanging.

Quick Tip

Understand classifications of hanging based on body position and ligature application.

Question 13.

Indented writing cannot be observed by:

Options:

- (1) Naked eye
- (2) ESDA
- (3) Electrophoresis
- (4) Microscopy

Correct Answer: (3) Electrophoresis

Solution:

Indented writing is detected using techniques like ESDA, microscopy, or visual inspection, but not electrophoresis.

Quick Tip
Use ESDA for detailed analysis of indented writing in forensic examinations.

Question 14.

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

Options:

- (1) Magistrate
- (2) Forensic serologist
- (3) Relatives
- (4) Medical officer

Correct Answer: (1) Magistrate

Solution:

A medico-legal autopsy requires permission from a magistrate to ensure legal compliance and validity.

Quick Tip
Ensure proper legal authorization before performing a medico-legal autopsy.

Question 15.

Latent fingerprints can be developed by:

Options:

- (1) Neutron Activation Analysis
- (2) Casting
- (3) Electrophoresis
- (4) Iodine fuming

Correct Answer: (4) Iodine fuming

Solution:

Iodine fuming is commonly used for developing latent fingerprints as it reacts with oils and sweat.

Quick Tip

Iodine fuming is an effective technique for visualizing latent fingerprints on porous surfaces.

Question 16.

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

Options:

- (1) Twinned loop
- (2) Lateral pocket loop
- (3) Central pocket loop
- (4) Accidental

Correct Answer: (2) Lateral pocket loop

Solution:

A lateral pocket loop has two distinct loops with cores opening towards the same side, forming a unique pattern.

Quick Tip

Familiarize with fingerprint patterns for accurate identification.

Question 17.

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

Options:

- (1) Writing slant
- (2) Form of allelographs
- (3) Writing alignment
- (4) Embellishments

Correct Answer: (4) Embellishments

Solution:

Embellishments are individual characteristics, while slant, form, and alignment are considered class characteristics.

Quick Tip

Differentiate class and individual handwriting traits for forensic analysis.

Question 18.

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

Options:

- (1) Cuticle
- (2) Cortex
- (3) Medulla
- (4) Shaft

Correct Answer: (2) Cortex

Solution:

The cortex is the middle layer of hair that contains pigment granules responsible for hair color.

Quick Tip

The cortex plays a key role in hair analysis due to its pigment content.

Question 19.

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

Options:

- (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 states that "every contact leaves a trace," forming the basis of forensic science.

Quick Tip

Edmond Locard's principle underlines the importance of trace evidence in crime scene investigations.

Question 20.

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

Options:

- (1) Decipherment
- (2) Detection
- (3) Efface
- (4) Lithographic process

Correct Answer: (1) Decipherment

Solution:

Decipherment involves reconstructing erased or obscured writings using specialized forensic techniques.

Quick Tip

Decipherment helps recover critical information from obliterated or tampered documents.

Question 21.

Which of the following is the sign of antemortem hanging?

Options:

- (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 as it occurs due to compression of the salivary ducts by the ligature.

Quick Tip

Look for physiological signs like dribbling of saliva to distinguish antemortem hanging from postmortem hanging.

Question 22.

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

Options:

- (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 result in PCR failure for longer amplicon lengths due to incomplete or fragmented templates.

Quick Tip
Shorter amplicons improve the success rate of PCR with degraded DNA samples.

Question 23.

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

Options:

- (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:

Bovine Serum Albumin (BSA) helps stabilize the reaction and is unrelated to contamination prevention in PCR setup.

Quick Tip
Focus on spatial separation of PCR steps and proper cleaning to prevent contamination.

Question 24.

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

Options:

- (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 hemoglobin in blood stains.

Quick Tip

Use Takayama reagent as a reliable confirmatory test for blood stains.

Question 25.

Arrange the following in chronological order:

Options:

- (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 sequence represents the development of firearms: Matchlock, Wheel lock, Snaphaunce, and Flint lock.

Quick Tip

Chronological understanding of firearm development aids forensic identification.

Question 26.

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

Options:

- (1) Sodomy
- (2) Incest
- (3) Bestiality
- (4) Buccal coitus

Correct Answer: (2) Incest

Solution:

Incest is categorized as a moral offence rather than an unnatural sexual offence.

Quick Tip

Distinguish moral offences like incest from unnatural sexual offences in legal contexts.

Question 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

Options:

- (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 correct sequence is: Securing the scene, Photography/videography, Collection of evidence, and Packaging of evidence.

Quick Tip

Follow a methodical sequence for crime scene management to maintain evidence integrity.

Question 28.

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

Options:

- (1) Chandigarh
- (2) Sagar, M.P.
- (3) Delhi
- (4) Mumbai

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

Solution:

Sagar University, Madhya Pradesh, was the first to introduce forensic science education in India.

Quick Tip

Sagar University pioneered forensic science education in India, setting a precedent for other institutions.

Question 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:

Options:

- (1) Normal phase
- (2) Reverse phase
- (3) Neutral phase
- (4) Stationary phase

Correct Answer: (1) Normal phase

Solution:

Normal phase chromatography uses a polar stationary phase and a non-polar mobile phase for separation.

Quick Tip

Understand the phase polarity for effective use of HPLC in analytical chemistry.

Question 30.

Which of these is not a fingerprint pattern?

Options:

- (1) Whorl
- (2) Arch
- (3) Loop
- (4) Ridge

Correct Answer: (4) Ridge

Solution:

Ridge is a general feature in fingerprints, not a specific pattern like whorl, arch, or loop.

Quick Tip

Focus on specific fingerprint patterns like whorl, arch, and loop for forensic classification.

Question 31.

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

Options:

- (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 to be visualized, such as dusting or chemical development.

Quick Tip

Latent fingerprints are the most common type of evidence at crime scenes and require enhancement for identification.

Question 32.

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

Options:

- (1) Grey powder
- (2) Silver nitrate
- (3) Ninhydrin
- (4) Super glue

Correct Answer: (2) Silver nitrate

Solution:

Silver nitrate reacts with sodium chloride in latent fingerprints to form silver chloride, which darkens upon exposure to light, making the prints visible.

Quick Tip

Use silver nitrate for latent fingerprint visualization when chloride residues are present.

Question 33.

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

Options:

- (1) Blood

- (2) Urine
- (3) Saliva
- (4) Vaginal discharge

Correct Answer: (3) Saliva

Solution:

The starch iodine test is used to detect amylase, an enzyme present in saliva, by observing the breakdown of starch.

Quick Tip
The starch iodine test specifically identifies saliva due to the presence of amylase.

Question 34.

Which of the following are examples of natural fibers?

- (A) Wool
- (B) Cotton
- (C) Rayon
- (D) Mohair

Options:

- (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:

Wool, cotton, and mohair are natural fibers, whereas rayon is a synthetic fiber.

Quick Tip
Identify natural fibers as those derived from plants or animals, such as wool and cotton.

Question 35.

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

Options:

- (1) Disguise writing
- (2) Manuscript writing
- (3) Guided writing
- (4) Forged writing

Correct Answer: (1) Disguise writing

Solution:

Disguise writing involves intentional modifications to handwriting patterns to avoid identification.

Quick Tip

Disguise writing is a deliberate act to obscure identity in handwriting analysis.

Question 36.

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

Options:

- (1) Electrophoresis
- (2) Polymerase chain reaction
- (3) Micrography
- (4) X-ray diffraction

Correct Answer: (1) Electrophoresis

Solution:

Electrophoresis separates molecules based on their charge and size under an electric field, commonly used in protein analysis.

Quick Tip

Electrophoresis is key for separating and analyzing proteins and nucleic acids.

Question 37.

Skid marks can be used to determine:

Options:

- (1) Type of vehicle
- (2) Speed of vehicle
- (3) Colour of vehicle
- (4) Height of vehicle

Correct Answer: (2) Speed of vehicle

Solution:

The length and pattern of skid marks are analyzed to estimate the speed of a vehicle during braking.

Quick Tip

Skid mark analysis is critical for determining vehicle speed in accident reconstruction.

Question 38.

Seminal fluid stain is identified by:

Options:

- (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, an enzyme present in seminal fluid.

Quick Tip

Use the acid phosphatase test as a presumptive test for seminal stains.

Question 39.

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

Options:

- (1) Tremor
- (2) Embellishment
- (3) Slant
- (4) Rhythm

Correct Answer: (1) Tremor

Solution:

Tremor in handwriting is indicative of unsteady hands, often associated with nervousness or physical conditions.

Quick Tip

Tremors in handwriting indicate lack of fluidity, often due to external factors like stress.

Question 40.

In postmortem drowning cases, diatoms are mainly found in:

Options:

- (1) Sternum
- (2) Femur
- (3) Liver
- (4) Stomach

Correct Answer: (2) Femur

Solution:

Diatoms from drowning sites can enter the bloodstream and deposit in the bone marrow, such as in the femur.

Quick Tip

Look for diatoms in femur bone marrow to confirm postmortem drowning cases.

Question 41.

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

Options:

- (1) Restoration
- (2) Obliteration
- (3) Erasure
- (4) Separation

Correct Answer: (2) Obliteration

Solution:

Obliteration refers to the act of smearing or overwriting text to make it unreadable or undecipherable.

Quick Tip

Forensic document examination techniques such as UV or IR light can help recover obliterated writings.

Question 42.

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

Options:

- (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 small details that are not visible to the naked eye.

Quick Tip

Photomicrographs are essential for analyzing minute details in forensic evidence.

Question 43.

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

Options:

- (1) Pyrolytic GC
- (2) Low temperature GC
- (3) Headspace GC
- (4) Capillary GC

Correct Answer: (3) Headspace GC

Solution:

Headspace Gas Chromatography (GC) is widely used for the analysis of volatile substances like alcohol in biological samples.

Quick Tip

Headspace GC minimizes contamination risks while analyzing volatile compounds such as ethanol.

Question 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

Options:

- (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:

Complete close contact wounds often exhibit muzzle impressions and a seared zone caused by the hot gases released during firing.

Quick Tip

Close contact wounds often show unique marks like muzzle impressions and tissue searing.

Question 45.

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

Options:

- (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 a break in the stroke.

Quick Tip

Pen lifts can indicate deliberate pauses or natural interruptions in handwriting.

Question 46.

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

Options:

- (1) Ulnar loop
- (2) Radial loop
- (3) Double loop
- (4) Central loop

Correct Answer: (2) Radial loop

Solution:

Radial loops open toward the radius bone, which is on the thumb side of the hand.

Quick Tip

Remember, radial loops always flow toward the thumb side of the hand.

Question 47.

AFIS is the abbreviation used for:

Options:

- (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 is a computerized system for storing, searching, and matching fingerprints.

Quick Tip

AFIS is widely used in forensic investigations for quick and reliable fingerprint matching.

Question 48.

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

Options:

- (1) sp^3 hybridization
- (2) sp^2 hybridization
- (3) sp^2d hybridization
- (4) sp hybridization

Correct Answer: (1) sp^3 hybridization

Solution:

In alcohols, the carbon attached to the hydroxyl group has sp^3 hybridization due to its tetrahedral geometry.

Quick Tip

The sp^3 hybridization in alcohols allows for the tetrahedral arrangement of bonds.

Question 49.

The book called "Fingerprint" was written by:

Options:

- (1) Alphonse Bertillon
- (2) Francis Galton
- (3) Karl Landsteiner
- (4) Edmond Locard

Correct Answer: (2) Francis Galton

Solution:

Francis Galton's book "Fingerprint" laid the foundation for the scientific study and classification of fingerprints.

Quick Tip

Francis Galton is regarded as the pioneer of modern fingerprint analysis.

Question 50.

The scientific name of marking nut is:

Options:

- (1) Claviceps pupurea
- (2) Capsicum annum
- (3) Semicarpus anacardium
- (4) Azadirachta indica

Correct Answer: (3) Semicarpus anacardium

Solution:

The marking nut, known for its medicinal and toxic properties, is scientifically classified as Semicarpus anacardium.

Quick Tip

Semicarpus anacardium, or marking nut, is often used in traditional medicine and forensic applications.

Question 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:

Options:

- (1) But-1-yne
- (2) But-2-yne
- (3) But-1-ene
- (4) But-2-ene

Correct Answer: (1) But-1-yne

Solution:

The reaction with ammonical silver nitrate indicates the presence of a terminal alkyne group, which reacts to form a precipitate. But-1-yne fits the molecular formula and exhibits this behavior.

Quick Tip

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

Question 52.

What is the refractive index of water at $25^\circ C$?

Options:

- (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 1.333, a standard physical property of water.

Quick Tip

The refractive index of water is essential in calculating light refraction and is widely used in optics.

Question 53.

Which of the following has no charge?

Options:

- (1) Proton
- (2) Neutron
- (3) Electron
- (4) Anion

Correct Answer: (2) Neutron

Solution:

A neutron is a subatomic particle with no electrical charge, found in the nucleus of an atom.

Quick Tip

Neutrons are neutral particles, unlike protons (positive) and electrons (negative).

Question 54.

The study of hair is known as:

Options:

- (1) Histology
- (2) Palynology
- (3) Trichology
- (4) Hematology

Correct Answer: (3) Trichology

Solution:

Trichology is the branch of science concerned with the study of hair and scalp health.

Quick Tip

Trichology is used in forensic investigations to analyze hair for clues.

Question 55.

The following characteristics are peculiar to ballpen writings:

Options:

- (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 darker double tracks within the stroke and burr striations caused by the rolling ball mechanism.

Quick Tip

Analyze ballpen writings for unique features like track marks and burrs to identify the writing instrument.

Question 56.

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

Options:

- (1) AFIS
- (2) CODIS
- (3) ISIA
- (4) DOPA

Correct Answer: (2) CODIS

Solution:

CODIS (Combined DNA Index System) is a software platform used by the FBI for storing and comparing DNA profiles.

Quick Tip

CODIS allows for quick DNA matching across forensic databases worldwide.

Question 57.

Rh factor was discovered by:

Options:

- (1) Landsteiner
- (2) Mendel
- (3) Hugo
- (4) Pearson

Correct Answer: (1) Landsteiner

Solution:

Karl Landsteiner discovered the Rh factor, a significant antigen in blood grouping.

Quick Tip

The Rh factor is crucial in determining blood compatibility during transfusions.

Question 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

Options:

- (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 is matched with its respective evidence type based on forensic applications.

Quick Tip

Learn to associate forensic instruments with their specific applications for accurate analysis.

Question 59.

Which of the following tests is based on hemoglobin activity?

Options:

- (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 detects hemoglobin activity, turning pink in the presence of blood.

Quick Tip

Use the Kastle Meyer test for rapid, presumptive blood identification.

Question 60.

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

Options:

- (1) Dimers
- (2) DNTPs
- (3) Primers
- (4) Restriction Enzyme

Correct Answer: (4) Restriction Enzyme

Solution:

Restriction enzymes cleave DNA at specific sequences, aiding in recombinant DNA technology.

Quick Tip

Restriction enzymes are molecular scissors crucial for DNA fragment manipulation.

Question 61.

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

Options:

- (1) Centrifuge
- (2) Thermal cycler
- (3) Incubator
- (4) Vortex

Correct Answer: (2) Thermal cycler

Solution:

The thermal cycler, also known as a PCR machine, is used to amplify DNA sequences by cycling through precise temperature changes during the polymerase chain reaction (PCR) process.

Quick Tip

Thermal cyclers are crucial in molecular biology for tasks like DNA replication and forensic analysis.

Question 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

Options:

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

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

Solution:

Each post-mortem staining color corresponds to specific causes of death: Cherry red to carbon monoxide poisoning, bright pink to refrigerated body, dark brown or yellow to potassium chlorate poisoning, and chocolate to phosphorus poisoning.

Quick Tip

Post-mortem staining is an essential indicator in forensic pathology to determine the cause of death.

Question 63.

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

Options:

- (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 used to develop latent fingerprints on non-porous surfaces by polymerizing the cyanoacrylate onto fingerprint residues.

Quick Tip

Super glue fuming is highly effective for latent print development on materials like glass and metal.

Question 64.

Match the following:

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

Options:

- (1) (A) - (V), (B) - (I), (C) - (I), (D) - (III)
- (2) (A) - (I), (B) - (III), (C) - (I), (D) - (V)
- (3) (A) - (I), (B) - (III), (C) - (IV), (D) - (II)
- (4) (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

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

Solution:

The matching involves identifying characteristics of writings to confirm their uniqueness and determining class and individual traits.

Quick Tip

Class characteristics are common to a group, while individual characteristics are unique to a person.

Question 65.

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

Options:

- (1) Reflection index
- (2) Medullary index
- (3) Refractive index
- (4) Reflux index

Correct Answer: (3) Refractive index

Solution:

The refractive index measures how light bends when transitioning between mediums, such as from air to water.

Quick Tip

Refractive index is fundamental in optics and forensic glass analysis.

Question 66.

Match List-I with List-II:

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

Options:

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

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

Solution:

Different weapons leave distinct wound patterns, allowing forensic experts to deduce the cause of injuries.

Quick Tip

Match wound types with weapons based on the injury's depth, shape, and features.

Question 67.

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

Options:

- (1) Enzyme
- (2) Lactose
- (3) Cellulose
- (4) Fructose

Correct Answer: (1) Enzyme

Solution:

Enzymes are biological catalysts that accelerate biochemical reactions without being consumed.

Quick Tip

Enzymes are critical in forensic toxicology for detecting metabolic pathways.

Question 68.

Match List-I with List-II:

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

Options:

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

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

Solution:

Phenotypes correspond to specific antibodies, aiding in blood type determination.

Quick Tip

Blood typing is crucial for transfusions and forensic identification.

Question 69.

Match List-I with List-II:

List-I (Branches)	List-II (Study area)
(A) Podogram	(I) Foot Prints
(B) Cheiloscopy	(II) Fingerprints
(C) Palatoscopy	(III) Lip Print
(D) Dactylography	(IV) Palatal Rugae

Options:

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

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

Solution:

Each branch of forensic science is associated with a unique study area, like lip prints and fingerprints.

Quick Tip

Forensic branches like cheiloscopy and dactylography help identify individuals.

Question 70.

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

Options:

- (1) Skid marks
- (2) Tread marks
- (3) Acceleration marks
- (4) Yaw marks

Correct Answer: (4) Yaw marks

Solution:

Yaw marks are curved tire marks formed when a vehicle loses control and turns while moving.

Quick Tip

Yaw marks are used in accident reconstruction to determine vehicle speed and trajectory.

Question 71.

What is the full form of FIR?

Options:

- (1) First Investigation Report
- (2) First Information Representor
- (3) First Information Report
- (4) First Information Request

Correct Answer: (3) First Information Report

Solution:

The FIR, or First Information Report, is a written document prepared by police when they receive information about the commission of a cognizable offense.

Quick Tip

The FIR is the first step in a criminal investigation and must be filed promptly.

Question 72.

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

Options:

- (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, grooves, and ribs, which are designed to enhance grip and stability.

Quick Tip

Tire tread analysis is crucial in forensic investigations to match vehicles to crime scenes.

Question 73.

Which of the following has the highest alcohol percentage?

Options:

- (1) Wine
- (2) Rum
- (3) Champagne
- (4) Beer

Correct Answer: (2) Rum

Solution:

Rum typically contains a higher alcohol content, ranging from 40

Quick Tip

Rum is distilled, which increases its alcohol content compared to fermented beverages like wine and beer.

Question 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 annum	(IV) Arandi

Options:

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

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

Solution:

The scientific names of these vegetable poisons correspond to specific toxins: Ricinus communis (Arandi), Croton tiglium (Jamalgota), Semecarpus anacardium (Dhobis nut), and Capsicum annum (Lal mirch).

Quick Tip

Identifying vegetable poisons and their scientific names is critical in toxicology cases.

Question 75.

Match the following with their active principle component:

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

Options:

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

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

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

Solution:

The active principle components of these plants are Oleander (Nerine), Betel Nut (Arecoline), Aconite (Pseudaconitine), and Tobacco (Nicotine).

Quick Tip

Recognizing plant toxins and their active components aids in forensic toxicology analyses.