

ANSWER KEYS

(Correct Answers are marked in Bold Letters)

SECTION-A

- The ratio of ages of A and B is 3:5. If A is 24 years old, what is B's age?**
 - 36 years
 - 40 years**
 - 30 years
 - 28 years
- Find the missing term: 7, 14, 28, 56,?**
 - 84
 - 112**
 - 126
 - 98
- Assertion: Photography of the scene of crime plays a very important role in crime scene investigation.**
Reason: What a human may not be able to see can be recorded by a camera.
 - Both Assertion and Reason are false
 - Both Assertion and Reason are true**
 - Assertion is true but Reason is false
 - Assertion is false but Reason is true
- The jury system in India was formally abolished after which landmark case exposed its weaknesses in impartiality and susceptibility to public/media influence?**
 - K.M. Nanavati v. State of Maharashtra**
 - Kesavananda Bharati v. State of Kerala
 - Indira Gandhi v. Raj Narain
 - State of Uttar Pradesh v. Rajesh Talwar
- In a certain code, "ROAD" is written as "URDG". How is "PATH" written?**
 - SDWK**
 - QBUJ
 - RCUK
 - TCVL
- Which global pioneer is known as the "Father of Criminalistics"?**
 - Hans Gross**
 - Edmond Locard
 - Alphonse Bertillon
 - Francis Galton
- The acronym ISO, widely referenced in forensic laboratories and quality assurance systems, stands for:**
 - International Security Organization
 - International Standards Organization
 - International Organization for Standardization**
 - International Scientific Observatory
- Which of the following is not a class characteristic of evidence?**
 - Shoe size
 - Fiber type
 - DNA profile**
 - Caliber of firearm

9. **The chain of custody ensures:**
- Evidence is admissible in court**
 - Evidence is stored permanently
 - Evidence is photographed
 - All of the above
10. **Which fingerprint development technique is most effective on non-porous surfaces?**
- Ninhydrin
 - Cyanoacrylate fuming**
 - Silver nitrate
 - Iodine fuming
11. **Which microscope is most suitable for examining trace fibres?**
- Compound microscope**
 - Electron microscope
 - Stereo microscope
 - Phase contrast microscope
12. **If the probability of finding a specific fibre at a crime scene is 0.02, what is the probability of not finding it?**
- 1.00
 - 0.98**
 - 0.20
 - 98.98
13. **The Chi-square test statistic is calculated as:**
- $\Sigma(\text{Observed} - \text{Expected})^2 / \text{Expected}$**
 - $\Sigma(\text{Observed} - \text{Expected}) / \text{Expected}$
 - $\Sigma(\text{Observed} \times \text{Expected})$
 - $\Sigma(\text{Observed} + \text{Expected})$
14. **Measurement of uncertainty is crucial in forensic science because:**
- It quantifies reliability of results**
 - It eliminates errors
 - It replaces expert testimony
 - None of the above
15. **In criminal trials, the “CSI Effect” is most accurately described as:**
- The tendency of forensic experts to exaggerate scientific findings in court to secure convictions.
 - The influence of crime television shows on jurors’ expectations regarding the availability and conclusiveness of forensic evidence.**
 - The psychological trauma experienced by investigators after repeated exposure to violent crime scenes.
 - The procedural bias created when investigators rely exclusively on circumstantial evidence instead of forensic science.
16. **Arrange the changes that appear in a cadaver in sequential order.**
- Rigor, Marbling, Cooling, Mummification
 - Cooling, Rigor, Mummification, Marbling
 - Cooling, Rigor, Marbling, Mummification**
 - Rigor, Cooling, Marbling, Mummification
17. **Preservation of surface dust print of footprint cannot be done by the following:**
- Photography method
 - Tracing method
 - Electrostatic method
 - Casting method**

Arrange the following steps of criminal investigation in a proper sequence:

18. **I) Preservation of physical evidences**
II) Photography and sketching
III) Protection of scene of crime
IV) Information related to crime
- I, III, IV, II
 - III, IV, II, I
 - IV, III, II, I**
 - II, I, IV, III
19. **The Frye v. United States (1923) case introduced the “general acceptance” test. Which scientific method was being proposed?**
- Truth serum interview with scopolamine
 - Acoustic spectrographic voice analysis
 - Probability matrix for ridge identification
 - Systolic blood pressure deception test**
20. **Which forensic scientist pioneered fingerprint classification in India?**
- B.N. Mullick
 - Hem Chandra Bose**
 - Lalji Singh
 - P.C. Mahalanobis
21. **Which principle in forensic science asserts that while individuals may lie, the evidence and facts themselves remain truthful?**
- Locard’s Exchange Principle
 - Law of Individuality
 - Principle of Analysis
 - None of the above**
22. **Which landmark Indian case established admissibility of expert scientific evidence?**
- State of Maharashtra v. Damu**
 - Kesavananda Bharati v. State of Kerala
 - Maneka Gandhi v. Union of India
 - None of the above
23. **Which case is recognized as the first in the world to be solved using DNA fingerprinting evidence?**
- O.J. Simpson case (1995, USA)
 - Colin Pitchfork case (1987, UK)**
 - Green River Killer case (2001, USA)
 - Josef Mengele identification (1985, Brazil)
24. **Which of the following is a non-destructive forensic analysis technique?**
- Fourier Transform Infrared Spectroscopy (FTIR)**
 - Atomic Absorption Spectroscopy (AAS)
 - Gas Chromatography – Mass Spectrometry (GC_MS)
 - Inductively Coupled Plasma-Optical Emission Spectroscopy (ICP-OES)
25. **Which of the following is a quality assurance measure in forensic laboratories?**
- Peer review of reports**
 - Destroying old evidence
 - Ignoring inconclusive results
 - Skipping calibration
26. **Which forensic discipline historically struggles most with Popperian falsifiability due to reliance on subjective interpretation?**
- Forensic DNA Profiling
 - Forensic Toxicology
 - Bitemark Analysis**

- d. None of the above
27. **Which of the following is considered pattern evidence?**
- Fingerprints**
 - Blood group
 - DNA
 - All of the above
28. **Which of the following is a class characteristic of firearms evidence?**
- Caliber**
 - Unique striation marks
 - Firing pin impression
 - Breech face marks
29. **The National Forensic Sciences University (NFSU) was formally established in India in which year?**
- 2015
 - 2020**
 - 2010
 - 2000
30. **Digital evidence must be authenticated using:**
- Encryption keys
 - Passwords
 - Hash values**
 - Firewalls
31. **Precision in forensic measurement refers to:**
- Closeness to true value
 - Repeatability of results**
 - Accuracy of instruments
 - Standardization
32. **The headquarters of the International Court of Justice is located at:**
- Paris
 - The Hague**
 - Geneva
 - New York
33. **In forensic handwriting analysis, the most common stroke pattern represents:**
- Mean
 - Mode**
 - Median
 - Range
34. **In forensic ballistics, the average velocity of bullets is calculated using:**
- Mode
 - Mean**
 - Median
 - Range
35. **In forensic DNA profiling, probability calculations are used to:**
- Determine allele frequency**
 - Determine Gene frequency
 - Determine DNA frequency
 - Determine STR frequency
36. **Which design feature is most commonly found on revolver cartridges to prevent them from slipping through the cylinder?**
- Extractor groove

- b. **Rimmed case head**
 - c. Tapered body
 - d. Rebated rim
37. **The null hypothesis in forensic hypothesis testing usually states:**
- a. Evidence is conclusive
 - b. **No significant difference exists**
 - c. Suspect is guilty
 - d. Witness is reliable
38. **Bharatiya Nyaya Sanhita (BNS), 2023 replaces which earlier legislation?**
- a. **Indian Penal Code, 1860**
 - b. Indian Evidence Act, 1872
 - c. Code of Criminal Procedure, 1973
 - d. Indian Contract Act, 1872
39. **Which area of the hand is considered the primary target for GSR collection because it is most likely to catch discharge gases?**
- a. The palm and the base of the wrist
 - b. The fingertips and under the fingernails
 - c. **The web area between the thumb and index finger**
 - d. The knuckles and outer edge of the pinkie finger
40. **Under which section of Indian law provision have been made that the Court can form an opinion by an expert upon a point of science**
- a. **Section 39 of BSA**
 - b. Section 47 of BSA
 - c. Section 329 of BNSS
 - d. Section 45 of BSA
41. **Within forensic anthropology, which limitation applies when determining cause versus manner of death?**
- a. **Cannot definitively establish physiological cause of death; only skeletal trauma**
 - b. Can always determine homicide manner from sharp force trauma
 - c. Can uniquely establish physiological cause when decomposition prevents toxicology
 - d. Uses isotopic bone analysis to determine cause of death
42. **Faraday bags used for mobile devices block RF signals by:**
- a. Altering wavelength of signals
 - b. Generating active jamming signals
 - c. **Creating conductive enclosure that cancels fields**
 - d. Absorbing RF waves into thermal energy
43. **When examining a crime scene for specific fibres or fluorescent powders, why is 365 nm (Longwave) typically preferred over 254 nm (Shortwave)?**
- a. Shortwave UV is too weak to cause fluorescence.
 - b. **Longwave UV is safer for the eyes and skin during prolonged searches.**
 - c. Shortwave UV only works on dark-coloured surfaces.
 - d. Longwave UV penetrates deep into the substrate to find hidden blood.
44. **Which Indian institution collaborated with the ICRC to establish a humanitarian forensics initiative?**
- a. **National Forensic Sciences University (NFSU)**
 - b. All India Institute of Medical Sciences (AIIMS)
 - c. Central Bureau of Investigation (CBI)
 - d. National Crime Records Bureau (NCRB)
45. **Which parameter in a gait pattern refers to the angle formed between the "line of progression" and the "long axis of the foot"?**

- a. Step Width
 - b. Foot Angle (or Toe-out/Toe-in angle)**
 - c. Stride Length
 - d. Cadence
46. **Which ISO number is for the competence and quality assurance of forensic science laboratories (testing and calibration)?**
- a. ISO/IEC 9001
 - b. ISO/IEC 14001
 - c. ISO/IEC 17025**
 - d. ISO/IEC 27001
47. **Which Indian state has the largest coastline?**
- a. Kerala
 - b. Gujarat**
 - c. Andhra Pradesh
 - d. Maharashtra
48. **Choose the word that best completes the analogy:
Ephemeral: Permanent: Transparent?**
- a. Opaque**
 - b. Clear
 - c. Translucent
 - d. Bright
49. **Which of the following sentences contains an error?**
- a. Neither of the boys is guilty.
 - b. Each of the players are ready.**
 - c. Everyone has submitted the form.
 - d. Much has been done already.
50. **A train 180 m long crosses a pole in 9 seconds. What is its speed?**
- a. 60 km/h
 - b. 72 km/h**
 - c. 80 km/h
 - d. 90 km/h

SECTION-B

51. **The most common toxic effect associated with methanol-contaminated country-made illicit liquor is:**
- Hypertension
 - Blindness**
 - Paralysis
 - Skin burns
52. **The sodium ions gives ----- color crystalline precipitates with Uranyl Zinc Acetate**
- Golden
 - White
 - Orange
 - None of the above**
53. **Composition of Brass is:**
- Copper and zinc**
 - Copper and tin
 - Iron and carbon
 - Aluminium and magnesium
54. **Petrol is majorly composed of:**
- Olefins
 - Paraffin**
 - Naphthene's
 - None of the above
55. **Organophosphate pesticides primarily act by inhibiting:**
- Catalase
 - Acetylcholinesterase**
 - Peroxidase
 - Cytochrome oxidase
56. **Nerve agent is:**
- Mustard gas
 - Sarin**
 - Phosgene
 - Chlorine
57. **Mustard gas primarily affects:**
- Skin and eyes**
 - Bones
 - Kidney only
 - Hair follicles only
58. **Deflagration is a process in which combustion propagates:**
- Faster than the speed of sound
 - By nuclear reaction
 - Slower than the speed of sound**
 - Without heat generation
59. **Black powder is an example of:**
- High explosive
 - Primary explosive
 - Low explosive**
 - Secondary explosive
- Single-base propellants mainly contain:**

60. a. TNT
b. Nitroglycerin
c. Nitrocellulose
d. RDX
61. **Accreditation body that accredits laboratories based on the clauses of ISO 17025 is**
a. NABL
b. NATA
c. UKAS
d. All of the above
62. **Heroin is classified as a:**
a. Stimulant
b. Hallucinogen
c. Depressant
d. Anabolic steroid
63. **The preliminary test for detection of barbiturates is :**
a. Scott test
b. Marquis test
c. Dille–Koppanyi test
d. Duquenois–Levine test
64. **Which class of drugs is commonly referred to as “date rape drugs”?**
a. Benzodiazepines
b. Antibiotics
c. Antipyretics
d. None of the above
65. **The poisonous gas which has a characteristic smell of bitter almonds is:**
a. Hydrogen sulphide
b. Carbon monoxide
c. Hydrogen cyanide
d. Chlorine
66. **Celphose tablets are used as fumigant insecticides on contact with moisture which toxic gas is released**
a. Phosgene
b. Isocyanides
c. Phosphine
d. All of the above
67. **The commonly used internal standard in Headspace Gas Chromatography (HS-GC) for alcohol analysis is:**
a. Methanol
b. Isopropyl alcohol (IPA)
c. Acetone
d. Ethylene glycol
68. **The primary organ responsible for the metabolism of most poisons and drugs is:**
a. Kidney
b. Brain
c. Liver
d. Lung
69. **The bacterium commonly associated with food poisoning due to contaminated food is:**
a. Salmonella
b. Mycobacterium tuberculosis
c. Vibrio cholerae

- d. *Treponema pallidum*
70. **Oleander poisoning is mainly caused by the presence of:**
- Alkaloids
 - Cardiac glycosides**
 - Cyanides
 - Organophosphates
71. **The high explosives present in plastic explosives are.....**
- PETN**
 - Tetryl
 - TNT
 - Ammonium Nitrate
72. **Which of the following is NOT a limitation of Beer Lambert's Law, which gives the relation between absorption, thickness and concentration**
- Concentration must be lower
 - Radiation must have higher bandwidth**
 - Radiation source must be monochromatic
 - Does not consider factors other than thickness and concentration
73. **The burning rate of black powder is controlled by**
- Grain Size
 - Composition
 - Configuration
 - All of the above**
74. **Propellants can be in the form.**
- Liquid
 - Solid
 - Granular
 - all of the above**
75. **The oxygen balance of TNT is**
- 73.96**
 - 21.61
 - 24.24
 - 10.12
76. **.....flash point apparatus is used for the detection of flash point of fuel and lubricants.**
- PMCC**
 - COC
 - Abel
 - None of the above
77. **The information obtained by performing Aniline test on petroleum products is.....**
- Aromatic Contents**
 - Aliphatic Contents
 - Olefins Contents
 - All of the above
78. **A particularly potent form of cannabis is called.....**
- Ganja
 - Sinsemilla**
 - Charas
 - None of the above
79. **.....have the highest smoke point.**
- Aromatics

- b. Naphthene's
c. **Paraffins**
d. All of the above
80. **The solvent system used for the detection of oil soluble dyes is.....**
a. **Hexane: Toluene: Acetic Acid (50:50:2)**
b. Acetone: Chloroform (80:20)
c. Methanol: Ammonia (100:1.5)
d. None of the above
81. **Psychoactive magic mushrooms refer to**
a. Psilocin
b. Psilocybin
c. **Both A & B**
d. None of the above
82. **Cannabinoids are class of compounds derived from.....**
a. **Terpenes & Phenol**
b. Alkaloids
c. Phenethylamines
d. None of the above
83. **“All substances are poisons: there is none which is not a poison. The right dose differentiates a poison and a remedy” was stated by**
a. Mathew Orifila
b. **Paracelsus**
c. Carl Wilhelm Scheele
d. Leo nardo da vinci
84. **LSD is encountered in the form of**
a. Microdots
b. Gelatin capsules
c. Blotter paper
d. **All of the above**
85. **Heroin is deacetylated to**
a. 6-acetylated Morphine
b. Morphine
c. Papaverine
d. **Both A & B**
86. **The binding site for drugs in plasma are predominantly.....**
a. **Albumin**
b. Glycoprotein
c. Glycosides
d. Globulin
87. **Marquis test gives color for amphetamine and methamphetamine.**
a. Black
b. Green
c. Pink
d. **Orange**
88. **Which of the following is used as an Arrow poison**
a. Strychnine
b. Aconite
c. Abrin
d. **All of the above**

89. **The term used in the situation in which both peaks are at the baseline is known as.....**
- Peak resolution
 - Baseline resolution**
 - Peak Intensity resolution
 - None of the above
90. **Sodium vapor lamp emit a yellow line at a wavelength of nm.**
- 589.3**
 - 460
 - 780
 - 240
91. **Mercury has oxidation state.**
- 0
 - 1
 - 2
 - 3**
92. **Raman interactions are dependent on existence of bonds.**
- Polar bonds
 - Polarizable bonds**
 - Both A & B
 - None of the above
93. **.....is an example of active toxic metabolites.**
- Methanol
 - Ethylene Glycol
 - DDE
 - All of the above**
94. **Cocaine is aalkaloid**
- Indole
 - Xanthine
 - Tropane**
 - All of the above
95. **.....is an example of synthetic opiate alkaloid.**
- Hydrocodone
 - Hydromorphone
 - Oxycodone
 - All of the above**
96. **MDA can be made from**
- Isosafrole**
 - Cathine
 - Cathinone
 - Khat
97. **Iodoform test is positive for**
- Ethyl Alcohol
 - Acetone
 - Acetaldehyde
 - All of the above**
98. **Neutron Activation Analysis is technique for multielement.**
- Qualitative
 - Quantitative
 - Both A & B**

- d. None of the above
99. **Scintillation is the process of turning radioactive energy into..... using a scintillator.**
- Light**
 - Heat
 - Wave
 - Steam
100. **In normal phase chromatography component is eluted first.**
- Most Polar
 - Mid Polar
 - Least Polar**
 - None of the above
101.are bending type of vibrations in IR.
- Rocking
 - Wagging
 - Twisting
 - All of the above**
102. **ILAC stands for**
- International Laboratory Accreditation Cooperation**
 - International Labor Accreditation Cooperation
 - International Laboratory Accuracy Calibration
 - None of the above
103. **Proof spirit is a mixture of alcohol and water, with combination of**
- 30% alcohol by volume
 - 37% alcohol by volume
 - 47% alcohol by volume
 - 57% alcohol by volume**
104. **If alcohol contains impurities of iron or copper treatment with concentrated nitric acid followed by Potassium Ferrocyanide reagent produces characteristic colours ----- respectively**
- Red or Blue
 - Green or Purple
 - Chocolate brown or Prussian blue**
 - Prussian blue or Chocolate brown
105. **Lead in petroleum is detected by which of the following technique**
- AAS
 - NAA**
 - GC-MS
 - HPLC
106. **The ratio of alcohol in the blood to alcohol in alveoli air is approximately**
- 1:2100
 - 2500:1
 - 2100:1**
 - 1:2500
107. **Which of the following is the major metabolite of methyl alcohol on oral administration?**
- Propionic acid
 - acetic acid
 - formic acid**
 - valeric acid
108. **Which one of the following cannot be conserved during Raman Scattering?**
- Total Energy
 - Momentum

- c. **Kinetic energy**
d. Electronic energy
109. **Which of the following are the antidotes in case of methanol poisoning?**
a. Acetylcystein
b. Ethanol
c. Hydroxy cobalamine
d. 4-methyl pyrazoid
110. **In which one of the following types of liquid chromatography, immobilized biochemical is used as a stationary phase?**
a. Ion exchange chromatography
b. Exclusion chromatography
c. Affinity chromatography
d. Gel permeation chromatography
111. **Which of the following are advantages of solid – phase extraction over liquid extraction?**
1. Small sample size
2. High solvent consumption
3. Emulsion formation
4. High extraction efficiency
a. 2 and 3 only
b. 1 and 2 only
c. 1 and 4 only
d. 3 and 4 only
112. **Which of the following are correct regarding the addition of internal standard (IS) during the extraction of drug from biomatrix?**
1. IS should mimic the physicochemical properties of the drug
2. IS should not compensate for any loss of drug
3. Stable – isotope labelled analogues of the drug are the best choice as IS
4. IS would make the method less sensitive
a. 1 and 2 only
b. 2 and 4 only
c. 1 and 3 only
d. 3 and 4 only
113. **The major component of 'Molotov' cocktail is**
a. gasoline
b. ethyl alcohol
c. lead azide
d. valine
114. **Photomultiplier tube is NOT suitable for detection of**
a. visible photons
b. UV photons
c. fluorescence
d. IR photons
115. **Which type of neutron is most suitable for NAA technique?**
a. Very low energy neutron
b. Cold neutron
c. Thermal neutron
d. High energy neutron
116. **Phenolphthalein is**
a. Carcinogenic
b. Laxative

- c. Indicator
 - d. Both a and b**
117. **Animal affected by poisons similar to human beings is:**
- a. Rabbit
 - b. Cat**
 - c. Frogs
 - d. Guinea pig
118. **Universal antidote contains:**
- a. Mag. oxide, Charcoal and Pot. permanganate
 - b. Mag. oxide, Charcoal and Tannic acid**
 - c. Charcoal, Pot. permanganate and Tannic acid
 - d. Pot. permanganate, Mag. oxide and Tannic acid
119. **X ray detectors are all except**
- a. Geiger Counter
 - b. Scintillator
 - c. Gas filled Detectors
 - d. Thermocouple**
120. **Bernoulli's Principle is used in**
- a. Ionization
 - b. Atomization**
 - c. Molecular breaking
 - d. Vaporization