

S/SO/2013/15

FORENSIC SCIENCE & FORENSIC BIOLOGY

Roll No.

--	--	--	--	--	--

Candidate should write his/her Roll No. in the box above. ↑

BOOKLET NO.

15101

Total No. of Questions : 150

Time : 2 Hours]

No. of Printed Pages : 36

[Total Marks : 300

INSTRUCTIONS FOR CANDIDATES

1. *All* questions are compulsory.
2. *All* questions carry equal marks.
3. The question paper contains **150** questions. The examinee should verify that the requisite number of questions are printed in the question paper, otherwise he should ask for another question paper.
4. The cover page indicates the number of printed pages in the question paper. The examinee should verify that the requisite number of pages are attached in the question paper otherwise he should ask for another question paper.
5. Read carefully the instructions given on the answer-sheet supplied and indicate your answers accordingly.
6. Kindly make necessary entries on the answer-sheet only at the places indicated and nowhere else.
7. Examinees should specially pay attention that **2** marks will be awarded for correct answer.
8. Examinees should do all rough work on the space meant for rough work on the last page of the question paper and nowhere else, not even on the answer-sheet.

S/SO/2013/15

Section A**(Forensic Science)**

1. Forensic Science is :
 - (A) Application of scientific methods and techniques for the purpose of justice
 - (B) Application of scientific methods and techniques for the purpose of law
 - (C) Application of scientific methods and techniques for police investigation
 - (D) Application of scientific methods and techniques for criminal investigation

2. Edmond Locard belonged to which country among the following ?
 - (A) USA
 - (B) UK
 - (C) France
 - (D) Vienna

3. Arrange the following in the proper order of investigation of crime at the scene of crime :
 - (i) Collection of clue material
 - (ii) Protection of scene of crime
 - (iii) Packing and labelling
 - (iv) Sketching and photographing of crime scene

Codes :

- (A) (ii), (iii), (iv), (i)
- (B) (ii), (iv), (i), (iii)
- (C) (i), (iv), (ii), (iii)
- (D) (iv), (ii), (iii), (i)

4. Why is photography the prerequisite in crime scene investigation ?
- (A) An unaltered condition
 - (B) To have it as a record for I.O.
 - (C) To keep it for future investigation
 - (D) To convince the court
5. Corroborative evidence is :
- (A) Evidence that refutes other evidence
 - (B) Evidence that links an individual with a particular location
 - (C) Evidence that supports other evidence
 - (D) Evidence that associates an individual with another individual
6. Which of the following statements is *not* true ?
- (A) Class characteristics enable an object to be placed into a particular category
 - (B) A class characteristic is one that enables an object to be uniquely identified
 - (C) A questioned sample is sometimes referred to as a disputed sample
 - (D) Individual characteristics are unique to a particular group

7. Which of the following statements is *true* ? The risk of contamination of evidence is controlled and/or minimized by :
- (A) Using chain of custody labels
 - (B) Minimising the number of people handling the evidence
 - (C) Opening each package in an area other than where it was originally sealed
 - (D) Storing packages in a dedicated secure area
8. The major limitation of crime scene reconstruction is that the evidence :
- (A) Can overwhelm the crime laboratory
 - (B) Usually provides less information than needed
 - (C) May have been staged
 - (D) Supports only one sequence of events
9. Why do forensic photographers often use scales in their photographs ?
- (A) They provide important information about the relative size of the objects
 - (B) They are particularly useful in courtroom situations
 - (C) Both (A) and (B) are correct
 - (D) They provide complete information

10. What do you mean by Hash in respect of Computer Forensics ?
- (A) Mathematical formula that generates a numerical identifier based on input data
- (B) If any bit of the input data changes, the output number changes
- (C) Both (A) and (B) are involved
- (D) None of the above is correct
11. Which of these instruments produces unique fragmentation pattern and works like Fingerprint for drug identification ?
- (A) GLC (B) HPLC
- (C) MS (D) AAS
12. The IR spectrum of a compound is equivalent to :
- (A) Fingerprint (B) DNA typing
- (C) Specific in identification (D) Invaluable
13. Narco-analysis technique is against which Article of Indian Constitution ?
- (A) Article 7 (B) Article 21(3)
- (C) Article 20(3) (D) Article 22(3)

14. Many ultra wide-angle or very short focal length lenses are known as :
- (A) Fish-eye lenses (B) Wide-eye lenses
- (C) Shallow lenses (D) A class lenses
15. Atomic absorption spectroscopy is used for the analysis of :
- (A) Solvents (B) Volatile compound
- (C) Non-metallic elements (D) Metallic elements
16. FTIR stands for :
- (A) Fourier Transform IR spectroscopy
- (B) Fourier Transmittance IR spectroscopy
- (C) Former Transform IR spectroscopy
- (D) None of the above
17. The device used for measuring brain response in brain fingerprinting is :
- (A) Electroencephalograph (B) Electroencephalogram
- (C) CT Scan (D) MRI

18. The rate of migration of a molecule in electrophoresis depends on :
- (A) Strength of the field
 - (B) Net charge, size and shape
 - (C) Ionic strength and viscosity
 - (D) All of the above
19. Among the following detectors used in HPLC which is considered as a universal Detector :
- (A) The UV detector
 - (B) The fluorescence detector
 - (C) The refractive index detector
 - (D) The electrochemical detector
20. Among the following which is the least important factors affecting the reproducibility of R_f values in TLC :
- (A) Stationary phase
 - (B) Mobile phase
 - (C) Temperature
 - (D) Development distance
21. A difference in the two indices of refraction exhibited by some crystalline materials is called :
- (A) Double refractive index
 - (B) Reflection
 - (C) Birefringence
 - (D) None of these

22. The microspectrophotometer employs the light :
- (A) UV (B) IR
(C) Oblique light (D) None of these
23. The scientist who gave chromatography concept was :
- (A) Berzelius (B) Avogadro
(C) Tswett (D) Lavoisier
24. An examination of the development stages of the insects present on the decomposing corpse may yield valuable information about :
- (A) The circumstances surrounding the death
(B) The post-mortem interval
(C) The identification of the deceased
(D) The age of the deceased
25. The scientific name of chiru is :
- (A) Antilope cervicapra (B) Vulpes bengalensis
(C) Capra aegagrus (D) Pantholops hodgsonii

26. The most versatile detector available today is :
- (A) FID (B) NPD
(C) MS (D) None of these
27. Substances having nearly equal values of Lambda maximum can be differentiated by :
- (A) UV visible spectrophotometry
(B) HPLC
(C) GC
(D) Derivative spectrometry
28. Beer-Lambert's law gives a linear correlation with positive gradient between :
- (A) Absorbance and concentration
(B) Absorbance and wavelength
(C) Molar extinction coefficient and absorbance
(D) Molar extinction coefficient and concentration
29. The light that has all its waves pulsating in unison is called :
- (A) Laser (B) Oblique light
(C) UV light (D) IR rays

30. In order to determine RI of glass which microscope is used ?
- (A) Polarizing microscope (B) Compound microscope
(C) Hot stage microscope (D) Stereomicroscope
31. Dr. Lawrence A. Farewell discovered :
- (A) Narco analysis (B) Brain fingerprinting
(C) DNA fingerprinting (D) Polygraphy
32. As we travel from visible region to radio waves in the electromagnetic spectrum, the frequency of rays :
- (A) Increases (B) Decreases
(C) Remains constant (D) All are correct
33. Name the filters used in PLM beneath the stage :
- (A) Polarizer (B) Analyzer
(C) Objective (D) None of these
34. All types of chromatography :
- (A) Have a stationary phase and a mobile phase
(B) Have chromatograms with peaks on a chart
(C) Can be used to separate explosive residues from the debris of an explosion
(D) Have a liquid mobile phase

35. The substances that vaporizes at temperature not higher than 300 celsius should be analysed by :
- (A) GC (B) HPLC
(C) MS (D) Py
36. In Forensic laboratory Pyrolysis-Gas chromatography can be used for the analysis of :
- (A) Paints only (B) Fibres only
(C) Plastics and Rubber only (D) All of these
37. A stereoscopic microscope is used for :
- (A) Comparing tool marks
(B) Separating useful evidence from contaminating materials
(C) Examinations requiring high magnification
(D) All of the above
38. Electron microscopes have higher powers of magnification than optical microscopes do because :
- (A) The human eye is more sensitive to electrons than to light rays
(B) The electron beam displaces electrons in the specimen
(C) The electron beam is not subject to refraction
(D) The electron beam operates at shorter wavelengths than light does

39. The operating principle of the mass spectrometer :

- (A) Is a function of the ionization rate of the sample compound
- (B) Is the same as the gas chromatograph but more accurate
- (C) Depends on the mass to charge ration of ionized particles
- (D) Was discovered in the 1960's

40. In Neutron activation analysis the sample is bombarded with :

- (A) Alpha rays
- (B) Beta rays
- (C) Gamma rays
- (D) Neutrons

41. When the temperature of a liquid is raised :

- (A) Its RI increases
- (B) Its RI decreases
- (C) Its RI disappears
- (D) Its RI remains constant

42. In Frye Vs. United States :

- (A) The trial judge admitted the results of the systolic blood pressure deception test, but he was reversed by the appeals court
- (B) Frye was found not guilty of murder
- (C) The appeals court set a standard of "general acceptance by the relevant scientific community"
- (D) The US Supreme Court ruled that the results of the deception test were inadmissible because of the decision in Daubert V. Merrill Dow

43. In microscopy, resolution is a measure of :
- (A) The ability of the lenses to separate two tiny details that are close together
 - (B) The total magnification power of the microscope
 - (C) The empty magnification of the microscope
 - (D) The ability of an electron microscope to determine the presence of a large number of elements
44. If a spectrophotometer has a photocell detector and xenon lamp source, it is a/an :
- (A) Mass spectrometer
 - (B) Infrared spectrophotometer
 - (C) Microwave instrument
 - (D) UV-visible spectrophotometer
45. The type of spectrometry that uses electrons to bombard a sample is :
- (A) Scanning electron microscopy
 - (B) Mass spectrometry
 - (C) Infrared spectrometry
 - (D) Microwave spectrometry

46. The parent peak in a mass spectrum refers to :
- (A) a substance used to calibrate the instrument
 - (B) the most abundant ion
 - (C) an ion that has lost two electrons
 - (D) the molecular ion
47. The part of the comparison microscope that allows the examiner to view two objects simultaneously is called the :
- (A) Comparator
 - (B) Comparison bridge
 - (C) Spectroscope
 - (D) Stage
48. In SEM, secondary electrons :
- (A) strike the object releasing other electrons
 - (B) strike the object and then reflect off the surface
 - (C) are emitted when a beam of primary electrons strikes the object
 - (D) are emitted by the nucleus of the various elements when the object is struck by a beam of X-rays
49. One of the major difference between GC and HPLC is that :
- (A) GC has liquid mobile phase
 - (B) GC uses columns to hold the mobile phase whereas HPLC does not
 - (C) GC columns are heated whereas HPLC columns are kept at room temperature
 - (D) HPLC always uses at least two liquids in its stationary phase

50. Potentiometry and colorimetry are techniques.
- (A) Optical (B) Electrical
(C) Chemical (D) Electro-chemical
51. Meta-analysis is :
- (A) Analysis of several analysis
(B) Analysis of large data
(C) Analysis of meaningful data
(D) Attempt to test the data
52. Karl Pearson's coefficient is the method :
- (A) For studying correlation
(B) For calculating probability
(C) For sampling
(D) For studying correlation and calculating probability
53. If a coin is tossed one time, what is the probability of occurring head ?
- (a) $\frac{1}{2}$
(b) 1
(c) 0.5
(d) $\frac{2}{3}$
- (A) (a) is correct (B) (b) is correct
(C) (a) and (c) are correct (D) (a) and (d) are correct

54. Wildlife (Protection) Act in India was enacted in :
- (A) 1974 (B) 1973
(C) 1972 (D) 1970
55. India became signatory to CITES in :
- (A) 1977 (B) 1985
(C) 1970 (D) 1976
56. Pugmark length or PML is :
- (A) The measurement between the outer edges of the first and last toe
(B) The measurement from the tip of the farthest toe to the base of the pad along the line of walk
(C) Both (A) and (B) are correct
(D) None of the above
57. The National Academy of Sciences in the year 2009 issued a report on "The polygraph and lie detector" concludes that the evidence collected using it is :
- (A) Reliable and justified
(B) Can be admitted in court as an evidence
(C) Unreliable, unscientific and biased
(D) None of the above

58. Narco analysis was first done by :
- (A) William Bleckwenn (B) Charles Darwin
(C) Robert House (D) Mathew Orfila
59. In polygraph application irrelevant questions :
- (A) Draw out a stressed response
(B) Evoke a deceptive response to a question
(C) Establish a base-line of subject's guilty-free reaction
(D) None of the above
60. Which of the following is considered to be an acceptable crime scene search pattern ?
- (A) A strip search (B) Spiral search
(C) Quadrant search (D) All of these
61. Which of the following regions of mt. DNA is used for species identification ?
- (A) HV 1 (B) Cyt b
(C) HV 2 (D) Loop
62. The examination of physical evidence by a forensic scientist is usually undertaken for :
- (A) Proving a suspect's innocence in a courtroom
(B) Proving a suspect's guilty in a courtroom
(C) Identification or comparison purposes
(D) Assisting law enforcement in the apprehension of an offender

63. Computer forensics involves all of the following stated activities *except* :
- (A) Manipulation of computer data
 - (B) Interpretation of computer data
 - (C) Presentation of computer data
 - (D) Extraction of computer data
64. The forensic examination or analysis of static data (stored) is often called :
- (A) Computer forensics
 - (B) Media forensics
 - (C) Media analysis
 - (D) All of these
65. According to the analysis of digital evidence, what should be the best practice ?
- (A) Forensic examination performances directly
 - (B) Design an examination process
 - (C) Create one or more duplicates of the original evidences
 - (D) The documentation and data reduction steps
66. The analysis of digital evidence comprise phases :
- (A) Documentation
 - (B) Data recovery
 - (C) Data reduction and extraction
 - (D) All of the above

67. The process of use of standards and controls for digital evidence is substantially different than those used in other forensic discipline :
- (A) Digital evidence examiners do not compare unknown evidence with known reference materials obtained from a reliable source
 - (B) Digital examiners cannot run known material in conjunction with the unknown evidence
 - (C) The process varies among laboratories
 - (D) All the above are true about the standards and controls for digital evidence process

68. Arrange in a proper sequence :

- (i) Reverse phase chromatography
- (ii) Partition chromatography
- (iii) Adsorption chromatography
- (iv) Gas chromatography

Codes :

- (A) (iii), (ii), (iv) and (i) are correct
- (B) (i), (iii), (iv) and (ii) are correct
- (C) (ii), (iii), (i) and (iv) are correct
- (D) (iv), (iii), (ii) and (i) are correct

69. The various definitions of quality *do not* include :
- (A) The value-based approach
 - (B) The transcendent approach
 - (C) The manufacturing-based approach
 - (D) The minimum specification approach
70. Accreditation as defined by ISO is :
- (A) Third party attestation related to a conformity assessment body conveying formal demonstration of its competence to carry out specific conformity assessment tasks
 - (B) Third party attestation related to products, processes, systems or persons
 - (C) Establishment of the status, legitimacy or appropriateness of an institution, programme or module of study
 - (D) Process in which certification of competency, authority, or credibility is presented
71. Which was the first Forensic lab. in India that got accreditation from NABL in 2001 ?
- (A) Central Forensic Science Laboratory, Hyderabad
 - (B) Central Forensic Science Laboratory, Kolkata
 - (C) Central Forensic Science Laboratory, Chandigarh
 - (D) Central Forensic Science Laboratory, CBI, Delhi

72. NABL is an autonomous body in India under the aegis of :
- (A) Council of Industrial and Scientific Research
 - (B) Department of Science and Technology
 - (C) University Grants Commission
 - (D) Indian Standardization Institute
73. The ISO 9000 series on quality management and QA/QC was established in :
- (A) 1991
 - (B) 1985
 - (C) 1987
 - (D) 2000
74. The isoelectric point (pI) of an amino acid or protein is :
- (A) The pH at which the amino acid or protein has no net charge
 - (B) Zero at pH 7.0
 - (C) The pH at which amino acid or protein is neither hydrophobic nor hydrophilic
 - (D) The measure of the hydropathy of an amino acid or protein
75. By adding SDS (Sodium Dodecyl Sulfate) during the electrophoresis of proteins, it is possible to :
- (A) Determine a protein's isoelectric point
 - (B) Determine an enzyme's specific activity
 - (C) Preserve a protein's native structure and biological activity
 - (D) Separate protein's exclusively on the basis of molecular weight

Section B**(Forensic Biology)**

76. Which is found in human semen ?
- (A) Zinc
 - (B) Acid phosphatase
 - (C) Spermine and choline and Acid phosphatase
 - (D) All of the above
77. pH of human semen is :
- (A) 4.5—5.0
 - (B) 5.5—6.5
 - (C) 6.5—7.0
 - (D) 7.5—8.0
78. A pair of dyes, picroindigo carmine and nuclear fast red collectively called Christmas tree stain is specific for :
- (A) Red Blood Cells
 - (B) White Blood Cells
 - (C) Fungal spores
 - (D) Human Spermatozoa
79. Full form of PGM is
- (A) Phospho Gluco Mutase
 - (B) Phospho Gluco Malase
 - (C) Pico Green Mutase
 - (D) Pyro Gluco Mutase

80. Benzidine Test for detection of blood is :
- (A) Highly specific
 - (B) Highly sensitive
 - (C) Highly specific and highly sensitive
 - (D) Neither specific nor sensitive
81. Heating of blood stain its peroxidase activity.
- (A) increases
 - (B) decreases
 - (C) destroys
 - (D) will not alter
82. Florence Test is conducted for identification of :
- (A) saliva
 - (B) semen
 - (C) urine
 - (D) blood
83. Diameter of shaft of human hair is :
- (A) 1—50 μ
 - (B) 51—150 μ
 - (C) 151—300 μ
 - (D) more than 3000 μ
84. Quantity of blood in human adult male :
- (A) 71 ml/kg body weight
 - (B) 61 ml/kg weight of body
 - (C) 81 ml/kg body weight
 - (D) 50 ml/kg body weight

85. Diatoms are found :
- (A) Only in pond water (B) Only in river water
(C) Only in wells (D) In all natural water sources
86. Diatoms are :
- (A) Unicellular algae (B) Multicellular algae
(C) Protozoa (D) Fungi
87. DNA is extracted from blood from :
- (A) Red Blood Cells (B) White Blood Cells
(C) Platelets (D) Whole blood
88. The cross-linking nucleic acid always pair :
- (A) Adenine with Guanine (B) Adenine with Cytosine
(C) Adenine with Thymine (D) Thymine with Cytosine
89. is a genetic locus useful for determining gender.
- (A) Y-STRs
(B) Amelogenin
(C) Both Y-STRs and Amelogenin
(D) Neither Y-STRs nor Amelogenin

90. CODIS stands for :

- (A) Combined DNA International System
- (B) Combined DNA Index System
- (C) Center of DNA Identity System
- (D) Center of DNA Identity Source

91. Picogram is :

- (A) One trillionth of a gram
- (B) One billionth of a gram
- (C) One millionth of a gram
- (D) None of these

92. Mitochondrial DNA is inherited from :

- (A) Father
- (B) Mother
- (C) Both Mother and Father
- (D) None of these

93. Type AB blood contains :

- (A) Both A and B Antigen
- (B) Both A and B Antibody
- (C) No Antigen
- (D) No Antibody

94. Amylase test is conducted for analysis of :

- (A) Blood
- (B) Semen
- (C) Saliva
- (D) Faecal matter

95. DNA molecule carries charge :
- (A) Negative (B) Positive
(C) Neutral (D) None of these
96. molecules are highly stable.
- (A) DNA (B) Protein
(C) Carbohydrate (D) None of these
97. How many blood group systems are there currently in use ?
- (A) 26 (B) 20
(C) 16 (D) 13
98. Quantity of DNA in a sperm cell :
- (A) 3 pg (B) 3 ng
(C) 3 μ g (D) 3 mg
99. Which of the following is *true* of mitochondrial DNA compared to nuclear DNA ?
- (A) There are many more variable regions in mitochondrial DNA
(B) There are larger repeats in mitochondrial DNA
(C) There are many more copies of mitochondrial DNA
(D) Mitochondrial DNA comes only from father

100. Which of the following is *not* a type of medulla found in a human hair ?
- (A) Fragmented (B) Continuous
(C) Stacked (D) Interrupted
101. Which is *true* about DNA typing of hair ?
- (A) Genomic DNA typing can be done on the shaft of the hair
(B) Only mitochondrial DNA typing is commonly done on human hair
(C) No DNA typing can be done on human hair
(D) Only hair in the anagen growing phase can be DNA typed
102. Dentine is
- (A) Harder than enamel
(B) Softer than enamel
(C) 95% calcium
(D) Neither harder nor softer than enamel
103. Saliva contains enzyme.
- (A) α -amylase (B) β -amylase
(C) α and β amylase (D) No
104. is/are included in axial skeleton.
- (A) Skull
(B) Hyoid bone and skull
(C) Vertebral column, skull and hyoid bone
(D) Skull, hyoid bone, vertebral column and ribs

105. How many bones are there in human body ?
- (A) 306 (B) 206
(C) 296 (D) 256
106. is the angle of sciatic notch in adult human female pelvis.
- (A) More than 76° (B) Less than 76°
(C) More than 56° (D) Less than 56°
107. Cervical vertebrae are in number in human body.
- (A) 11 (B) 9
(C) 7 (D) 5
108. is the bone for determination of sex in human body.
- (A) Tibia (B) Sternum
(C) Scapula (D) Sacrum
109. bones are there in appendicular skeleton of human body.
- (A) 106 (B) 206
(C) 126 (D) 76
110. Elements of sacrum are ossified completely by :
- (A) 13 years (B) 23 years
(C) 32 years (D) 63 years

111. Glenoid cavity is present in :
- (A) Sacrum (B) Femur
(C) Pelvic (D) Scapula
112. is the triangular bone at the base of spine normally made up of five fused vertebrae.
- (A) Manubrium (B) Pelvis
(C) Sacrum (D) Scapula
113. is the pelvic socket for the head of the femur.
- (A) Sciatic notch (B) Foramen
(C) Coccyx (D) Acetabulum
114. is the lowest portion of the sternum.
- (A) Metaphysis (B) Coccyx
(C) Coracoid process (D) Xiphoid process
115. Charge of DNA is due to :
- (A) Sugar (B) Phosphate group
(C) Nitrogen (D) All of these
116. Thoracic vertebrae in human body are :
- (A) 9 (B) 6
(C) 12 (D) 11

117. Lumber vertebrae in human body are :
- (A) 9 (B) 6
(C) 7 (D) 5
118. Blood group is universal donor.
- (A) AB (B) A
(C) B (D) O
119. Body tissues should *not* be preserved in solution for serological analysis and DNA analysis.
- (A) Formaline (B) Saline
(C) Water (D) Distilled water
120. Rh-factor of blood group is also known as :
- (A) Antigen A (B) Antigen H
(C) Antigen D (D) None of these
121. PCR was invented by :
- (A) Kary Mullins (B) Withrow et.al
(C) Chang (D) Joblings
122. In 1928, exchange principle was given in Forensic Science by :
- (A) Edward Oscar (B) Albert Schneider
(C) Edmond Locard (D) George Popp

123. is the male gametophyte of seed bearing plants.
- (A) Pollens (B) Spores
(C) Seeds (D) None of these
124. Rh antigen was discovered in the year :
- (A) 1901—1911 (B) 1911—1925
(C) 1921—1935 (D) 1937—1940
125. Kell, Duffy and Kidd systems were discovered in the year :
- (A) 1945—1965 (B) 1967—1975
(C) 1925—1935 (D) 1935—1940
126. HLA testing was developed and subsequently applied to paternity cases in the year :
- (A) 1925—1940 (B) 1937—1945
(C) 1945—1965 (D) 1965—1975
127. pH gradient in iso-electric focussing technique is generated through the use of unique molecules called :
- (A) Electrolytes (B) Alkali
(C) Acid (D) Ampholytes
128. There are genes in human mitochondrial DNA.
- (A) 67 (B) 27
(C) 37 (D) 1000

129. A technique to find variations in individuals of a population at DNA level is known as :
- (A) Meiosis (B) Sporogenesis
(C) DNA fingerprinting (D) RNA Synthesis
130. A device recording both blood pressure and galvanic skin response was invented by :
- (A) Dr. John A. Larson in 1920 (B) Dr. Harvard in 1915
(C) Marston in 1938 (D) Lamb in 2001
131. Who invented forensic DNA fingerprinting ?
- (A) Kary Mullis (B) Duffy
(C) Alec Jaffery (D) Edward
132. A technique that simultaneously detects more than one DNA marker in a single analysis is :
- (A) Sequencing (B) Electrophoresis
(C) Multiplexing (D) PCR
133. Differential DNA extraction method is carried out to separate
- (A) Plant enzymes (B) Nuclear material from plant cell
(C) Male and female fraction (D) All of these

134. Which one of the following is *not* derived from cannabis ?
- (A) Ganja (B) Bhang
(C) Heroin (D) Charas
135. Benzidine is sensitive upto in water.
- (A) 1 : 50,000 to 1 : 10,00,000 (B) 1 : 25,000 to 1 : 50,000
(C) 1 : 10,000 to 1 : 25,000 (D) 1 to 100
136. Standard method of carrying out search of the scene of crime.
- (A) Grid (B) Zone
(C) Spiral and circular (D) All of these
137. is the smallest bone in human body.
- (A) Atlas Vertebra (B) Fibula
(C) Stapes (D) Clavicle
138. 80% of follicles of scalp hair are in
- (A) Catagen stage (B) Anagen stage
(C) Telogen stage (D) All the three stages
139. Fluid portion of clotted blood is
- (A) Plasma (B) Serum
(C) Ground Tissue (D) Cytoplasm

140. test is done for the analysis of perspiration.
- (A) Gunzberg (B) Geese
(C) Benzidine (D) Amylase
141. Taq polymerase is obtained from
- (A) *Thermus aquaticus* (B) *Bacillus amyloliquefaciens*
(C) *Haemophilus gallinarum* (D) *Escherichia coli*
142. For long term storage, DNA samples are stored
- (A) at room temperature (B) at 4°C
(C) at -20°C (D) at -80°C
143. Which one of the following is a *correct* statement ?
- (A) Clavicle bone is the best bone sample for DNA analysis
(B) Formalin should be used to preserve samples for DNA analysis
(C) DMSO is the best preservative for tissue samples for DNA analysis
(D) Blood stained cloth should be dried with hot air blower before packaging
144. Palynology deals with :
- (A) Study of animal fossils (B) Study of rocks
(C) Study of pollen grains (D) Palm reading

145. Restriction endonuclease is used in
- (A) PCR technique (B) RFLP technique
(C) Extraction technique (D) Quantitation technique
146. Gunzberg's test is done for detection of :
- (A) Vomit (B) Semen
(C) Saliva (D) Sweat
147. Which of the following is *not* a polymorphic ?
- (A) Phosphoglucomutase (B) Acid Phosphatase
(C) Esterase D (D) Spermine
148. During PCR, in annealing step
- (A) DNA strand gets separated (B) Primer binding occurs
(C) Extension occurs (D) All of the above occur
149. Under ultra-violet light semen stains give :
- (A) White fluorescence (B) Green fluorescence
(C) Bluish white fluorescence (D) Pink fluorescence
150. pH of blood is
- (A) 7.0 (B) 9.4
(C) 7.4 (D) 6.4