

S/SO/2013/04

FORENSIC SCIENCE & FORENSIC PHYSICS

Roll No.

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BOOKLET NO.

4011

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

Total No. of Questions : **150**

Time : **2 Hours**]

No. of Printed Pages : **32**

[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/2013/04

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 Physics)**

76. Forensic physics can be defined as :
- (A) The science of nature or of natural objects
 - (B) That branch of science which treats the laws and properties of matter and forces acting upon it
 - (C) That department of natural science which treats the cases
 - (D) The application of physics for discussion, debate, argumentation or legal purposes
77. The examination of physical evidence by 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
78. Which of the following is *not* an example of a questioned document ?
- (A) A forged passport
 - (B) A stolen traveller's check or a threatening message written in spray paint on the side of someone's house
 - (C) A copy of a ten dollar bill made in a photocopier
 - (D) All of the above are examples of a questioned document
79. Which of the methods can be used for determining the age of an ink ?
- (A) TLC
 - (B) IR spectrophotometers
 - (C) Fluorescence
 - (D) LD-MS

80. Which of the following is not *true* of handwriting ?
- (A) It changes throughout life
 - (B) It is not affected by drugs or alcohol
 - (C) It is not subconscious behaviour
 - (D) It can change with the context of the writing
81. Which of the following practices of collecting exemplars will help to minimize the chance of the writer deliberately altering his or her writing ?
- (A) Have the subject stand up while writing
 - (B) Always use lined paper to make sure that the subject writes in straight lines
 - (C) Dictate long passages
 - (D) Show the subject the questioned document
82. The most expert forgeries are done :
- (A) By tracing
 - (B) Freehand
 - (C) With a light table
 - (D) With carbon paper
83. Indented writing may be deciphered by :
- (A) Ultra-violet photography
 - (B) Iodine fuming
 - (C) Photography under grazing illumination with a polarizing filter
 - (D) Thin layer chromatography
84. Charred documents can be strengthened with :
- (A) Polyvinyl acetate in acetone solution
 - (B) Concentrated sulphuric acid
 - (C) Isopropanol
 - (D) Scotch tape
85. Which chemical test is used for the identification of cement ?
- (A) Phenolphthalein test
 - (B) Reinsch's test
 - (C) Thymolphthalein test
 - (D) Iodoform

86. Which of the following is a regenerated fibre ?
- (A) Rayon (B) Polyester
(C) Nylon (D) Second growth silk
87. Acetate is made from :
- (A) Polyvinyl (B) Soya beans
(C) Wood pulp (D) Polyethylene glycol
88. In cross-section synthetic fibres can appear :
- (A) Round (B) Octalobal
(C) Trilobal (D) All of these
89. The instrumental analysis most useful for identification of synthetic fibres are :
- (A) X-ray diffraction and gas chromatography
(B) Mass spectrometry and emission spectrophotometry
(C) Pyrolysis and atomic absorption spectrophotometry
(D) Infrared spectrophotometry and Pyrolysis-gas chromatography
90. Among the following which is a non-destructive technique to be used in fibre Identification :
- (A) FTIR microscope (B) Py-Gc
(C) TLC (D) None of these
91. Microscopic fibres are best collected from clothing by means of :
- (A) Transparent adhesive tape
(B) A thorough brushing
(C) Shaking the article into a bag
(D) Tweezers
92. Glass is basically a mixture of :
- (A) Phosphates and carbonates (B) Silicates of sodium and calcium
(C) Oxides and metals (D) None of these

93. When an object strikes flat pieces of glass and the glass remains whole, one can investigate the :
- (A) Conchoidal striations
 - (B) Radial fractures
 - (C) Concentric fractures
 - (D) Both radial and concentric fractures
94. If known and unknown pieces of glass are examined under a microscope and their Back lines disappear at the same point, the refractive index of the unknown piece is :
- (A) Greater than the known
 - (B) Less than the known
 - (C) Equal to the known
 - (D) None of these
95. Which of the following techniques is used to compare trace elements found in soil ?
- (A) Spectrographic analysis
 - (B) Macroscopic examination
 - (C) Density
 - (D) Enzyme analysis
96. When comparing soil samples by macroscopic examination one should :
- (A) Observe colour
 - (B) Observe granularity and dry the samples
 - (C) Both (A) and (B)
 - (D) Observe density
97. The instrumental techniques most commonly used for indentifying binders are :
- (A) Infrared spectrophotometry
 - (B) Pyrolysis–gas chromatography
 - (C) Both (A) and (B)
 - (D) Emission spectrography

98. Paint chip received in the Forensic Science laboratory consists of :
- (A) Pigments that give colour and opacity
 - (B) Binders that hardens and holds the pigments in suspension
 - (C) Thinner and solvents drying process
 - (D) Only (A) and (B)
99. Titanium dioxide is used in paint for :
- (A) Binder
 - (B) Dryer
 - (C) Solvent
 - (D) Pigment
100. Pigments in Paints are analysed using :
- (A) SEM
 - (B) FTIR
 - (C) Py-GC
 - (D) All of these
101. A non-destructive instrumental test to determine the crystalline structure of the chemical compounds in paint is called :
- (A) X-ray diffraction
 - (B) Emission spectrography
 - (C) Pyrolysis-Gas chromatography
 - (D) Infrared spectrophotometry
102. Which of the following should be criminalist/forensic expert not do to a tool mark ?
- (A) Take a photograph
 - (B) Make a cast of the tool mark
 - (C) Insert a tool to see if it fits the tool mark
 - (D) Transport the tool mark to the laboratory
103. The scanning electron microscope is the best instrument for examining tool marks.
- (A) True
 - (B) False
 - (C) Only sometimes
 - (D) Cannot be used in tool marks examination

104. Which type of tool marks do not make a valuable evidence than the others in case of wood surface ?
- (A) Compression (B) Scraping
(C) Shearing (D) None of these
105. The sound spectrograph is designed to analyse all, *except* :
- (A) Frequency (B) Duration
(C) Amplitude (D) Latitude
106. A clear tool mark can be found on which type of surface ?
- (A) Metal (B) Wood
(C) Painted wood (D) All of these
107. Voice prints can be affected by :
- (A) Age and emotional stress
(B) The amount of moisture lining the throat
(C) Background noise and colds and Laryngitis
(D) All of the above
108. The first-formant frequency of the voice can go as high as :
- (A) 50 cycles per second (B) 500 cycles per second
(C) 5000 cycles per second (D) 50,000 cycles per second
109. When restoring a serial number, the Forensic expert :
- (A) Applies the etchant with a fingertip
(B) Lets the etchant sit on the metal overnight
(C) Uses the same reagent for iron, copper and aluminium
(D) Records the number photographically
110. Serial number restoration is possible because :
- (A) Criminals seldom grind away the entire serial number
(B) The grinding process impresses microscopic metal shavings into the metal which follow the outlines of the number
(C) The force used to stamp the number into the metal changes the underlying crystalline structure
(D) The metal under lying the serial number is amorphous

111. Among the following restoration procedure which one is simple and most reliable used in a Forensic Science Laboratory ?
- (A) Chemical etching (B) Electrolytic etching
(C) Magnetic particle (D) None of these
112. Which of the following is *true* about serial number restoration ?
- (A) Serial number can be restored on any surface
(B) The metal below a stamped serial number is more dense than the surrounding metal, making it slower to dissolve in an etching solution
(C) The metal below a stamped serial number is strained making it faster to dissolve in an etching solution than the surrounding metal
(D) Once restored, serial numbers remain visible permanently
113. Incomplete erased pencil writing can sometimes be deciphered by :
- (A) Under the stereomicroscopic microscope/infrared photography
(B) Compound microscope
(C) Comparison microscope
(D) Scanning electron microscope
114. The indented writing can be deciphered *except* by :
- (A) Illumination from the side and almost parallel to the paper
(B) Fuming with iodine vapours
(C) Close up photography using polarizing lens
(D) Fluorescence photography
115. Among the following which instrument techniques will be used for the identification of Cements ?
- (A) HPLC and FTIR
(B) UV-VIS Spectroscopy and IR spectroscopy
(C) ICP and XRD
(D) TLC and HPTLC

116. Among the following which is/are the main constituent(s) of Cement ?
- (A) Dicalcium and tricalcium silicates
 - (B) Tricalcium aluminate
 - (C) Tetracalcium alumino ferrite
 - (D) All of the above
117. What are the factors that are considered for identifying fake currency notes ?
- (A) Paper
 - (B) Printing Process
 - (C) Security features
 - (D) All of these
118. Which is the best or common method of currency counterfeiting ?
- (A) Intaglio printing
 - (B) Bleaching of low denomination notes
 - (C) Typographic printing
 - (D) Offset printing
119. The tagging of ink means :
- (A) Putting a price tag after manufacturing
 - (B) Adding something to ink
 - (C) As a marker for ink dating during manufacturing process
 - (D) None of the above
120. Variations or differences in the handwriting that cannot be accounted for any logical reason that is internal or external factors are known as :
- (A) Natural variation
 - (B) Fundamental divergence
 - (C) Both (A) and (B)
 - (D) None of these

121. Natural variations in handwriting are present because :
- (A) Brain does not work like a computer
 - (B) Brain gets distracted easily by the external and internal influences
 - (C) Man is not like printing machine to create the same writing time and again
 - (D) All of the above
122. Minimum magnification required for examination of fibre of currency notes :
- (A) 10-40 X
 - (B) 40-100 X
 - (C) 20-30 X
 - (D) 100-200 X
123. The main cause of the deterioration of paper is :
- (A) Basicity
 - (B) Acidity
 - (C) Neutrality
 - (D) None of these
124. The age of the document *cannot* be absolutely determined because :
- (A) No standard data is available
 - (B) Tagging of ink is not done routinely
 - (C) Watermarks are normally not present
 - (D) None of the above
125. What is meant by a anonymous letter ?
- (A) An unsigned letter
 - (B) Contains no obvious clue to the identity of the writer
 - (C) Both (A) and (B)
 - (D) City is unknown from where it came from
126. What is meant by ambidextrous ?
- (A) A person who writes with feet
 - (B) A person who writes with unusual hand
 - (C) A person who writes with both hands with equal fluency
 - (D) A person who is a disguiser

127. Match an item in one list with an item in the other list and choose the correct option from the codes given below :

List I

- (a) A.S. Osborn
 (b) Hilton
 (c) Harrison and Wilson
 (d) M.K. Mehta

List II

- (i) Suspect Documents
 (ii) Questioned Documents
 (iii) Handwriting identification
 (iv) Identification of handwriting and cross-examination of experts

Codes :

- | | | | | |
|-----|-------|-------|------|------|
| | (a) | (b) | (c) | (d) |
| (A) | (ii) | (iii) | (i) | (iv) |
| (B) | (i) | (iii) | (ii) | (iv) |
| (C) | (iii) | (ii) | (i) | (iv) |
| (D) | (iv) | (iii) | (ii) | (i) |

128. The security thread in a genuine currency note is :

- (A) A line made by printing
 (B) Thread inserted in a paper
 (C) Impressed by a roller in a pulpy state
 (D) Metallic foil inserted in paper

129. A signature can be termed as forgery when :

- (A) Tracing outline is seen
 (B) Overlapping of questioned and standard signatures
 (C) Carbon paper residues
 (D) All of the above

130. Genuine watermark in a paper is caused by :
- (A) Special printing process
 - (B) Dispersion of fibres at the time of manufacturing
 - (C) Wax of ferrated roller
 - (D) Use of ferrated roller
131. Identification of handwriting involves :
- (A) The examination of individual characteristics
 - (B) The examination of all the characteristics present in the handwriting along with the range of natural variation present and individual characteristics
 - (C) The examination of writing variations
 - (D) Writing forms of qualities
132. The first GEQD centre in India was established in :
- (A) 1904
 - (B) 1906
 - (C) 1910
 - (D) 1957
133. When a cast is being made with Plaster of Paris :
- (A) The plaster should be poured directly from the mixing bowl into the impression
 - (B) A thin mixture will record microscopic details
 - (C) The print should be reinforced by spraying shellac into it
 - (D) Salt can be added to the mixture to retard the setting rate
134. Microscopic details can be captured in casts made with :
- (A) Liquid silicone rubber
 - (B) Moulage
 - (C) Both (A) and (B)
 - (D) High quality plaster

135. A cast made of shoe print in mud :
- (A) Is a positive replica of the impression
 - (B) Is a positive replica of the shoe
 - (C) Is exactly the same size as the shoe
 - (D) Can be compared directly with the impression
136. In the examination of tyre marks :
- A. A single cast eight feet long should be made of each track
 - B. The cast should be compared directly with the suspect tyre
 - C. A cast of the evidence track should be compared with the cast of a track made by the suspect tyre
 - D. Nicks and irregularities caused by wear are used to identify the make and model of the tyre
137. Which of the following is demonstrative evidence ?
- (A) Fibres found on the victim of a homicide
 - (B) Fibres taken from the suspect in a homicide
 - (C) A scale drawing of the crime scene
 - (D) The get away car used by the suspect to flee the crime
138. Chemical erasures of words or numbers may be revealed by examination of handwriting under :
- (A) X-ray fluorescence
 - (B) U.V. light
 - (C) Infrared luminescence
 - (D) Visible light
139. Minimum magnification required for observation of security features in currency notes is :
- (A) 10-40 X
 - (B) 40-100 X
 - (C) 20-30 X
 - (D) None of these

140. Traced signature when viewed under stereoscopic microscope reveals :
- (A) Sharp curves (B) Wavering, unsteady line
(C) Unsteady line (D) Shading
141. Adding boron to molten glass :
- (A) Makes it more stable to rapid temperature changes
(B) Adds a greenish tint to the glass
(C) Makes the glass much harder
(D) Has no effect on glass
142. In order to compare two samples of soil by density gradient tube technique which liquid/s is/are used ?
- (A) Tetrabromoethane (B) Ethanol
(C) Both (A) and (B) (D) Benzene
143. Tyre marks on the road can be lifted by :
- (A) Plaster of Paris casting (B) Tracing method
(C) Wood metal (D) All of these
144. The speed and size of the vehicle can be determined by :
- (A) Scattering of blood
(B) Position of the deceased on the road
(C) Skid marks
(D) Presence of soil
145. What is/are the factor/s that create/s problem in the identification and comparison of voice ?
- (A) External noises
(B) Transmission rate vis-a-vis recording
(C) Malfunctioning of the device
(D) All of the above

146. Speaker identification is mostly done by which mode(s) in laboratories ?
- (A) Speakers recognition through listening (SRL)
 - (B) Automatic speaker recognition through computers (ASR)
 - (C) Both (A) and (B)
 - (D) Visual evaluation of voice spectrogram for speaker recognition (SRS)
147. Among these which one is *not* the component of human speech sound when analysed through sound spectrograph ?
- (A) Frequency
 - (B) Duration
 - (C) Amplitude
 - (D) Latitude
148. High power microscopic examination of soil will aid in :
- (A) Characterization of minerals
 - (B) Rocks present in earth materials
 - (C) Both (A) and (B)
 - (D) Animal materials
149. The development of man-made fibre (Nylon) occurred in :
- (A) 1937
 - (B) 1939
 - (C) 1941
 - (D) 1945
150. At the point where an object strikes a window, it puts :
- (A) Tension on the outer surface and compression on the inner surface
 - (B) Compression on the outer surface and tension on the inner surface
 - (C) Tension on both surfaces
 - (D) Compression on both surfaces