

S/SO/2013/07

FORENSIC SCIENCE & FORENSIC CHEMISTRY

Roll No.

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BOOKLET NO.

7021

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.

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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) *Antelope 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 λ_{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 hydrophathy 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

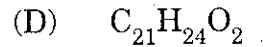
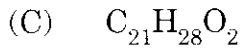
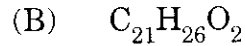
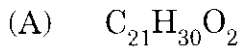
Section B**(Forensic Chemistry)**

76. Pipette, Burette and Measuring flask have :
- (A) Random error (B) Systematic error
(C) Standard error (D) Absolute error
77. Which parameter causes the uncertainty for analysis ?
- (A) Temperature (B) Random-Systematic error
(C) Standard error (D) Humidity
78. Indeterminate error is produced by :
- (A) Instrument (B) Software
(C) Measuring glassware (D) Balance
79. Nanogram measurement factor is :
- (A) 10^{-3} (B) 10^{-6}
(C) 10^{-9} (D) 10^{-12}
80. Femto unit factor is :
- (A) 10^{-9} (B) 10^{-12}
(C) 10^{-15} (D) 10^{-18}
81. The principle of chromatography is :
- (A) Absorption (B) Phase rule
(C) Affinity (D) Partition co-efficient

82. Major greenhouse gases are :
- (A) Carbon dioxide and methane (B) Nitrogen and oxygen
(C) Carbon monoxide (D) Sulphur dioxide
83. Size exclusion chromatography is applied for the analysis of :
- (A) Alcohols (B) Solvents
(C) Polymers and Proteins (D) Carbohydrates
84. Lambert and Beer law is applied for :
- (A) GC (B) UV
(C) GC-MS (D) Ion Chromatography
85. IR analysis is mainly used to determine the :
- (A) Functional group (B) Origin
(C) Cations (D) Cations and Anions both
86. Raman spectroscopy involves :
- (A) Light absorption (B) Scattering of light
(C) Decomposed light (D) Emission of light
87. Visible range (400—800 nm) is generated by :
- (A) Tungsten lamp (B) Deuterium lamp
(C) Hydrogen lamp (D) Mercury lamp

88. In case of suspected alcohol poisoning, blood should be collected from :
- (A) Heart (B) Pleural Cavity
(C) Abdominal Cavity (D) Peripheral Vein
89. Repeatability of measurement is called :
- (A) Accuracy (B) Precision
(C) Calibration (D) Error
90. Delirium is caused by :
- (A) Opium (B) Dhatura
(C) *Nux-vomica* (D) Calotropis
91. Free-base cocaine is used by :
- (A) Sniffing (B) Smoking
(C) Injecting (D) Ingestion
92. Which internal standard is used for the determination of alcohol in blood by GC-HS method ?
- (A) Ethyl acetate (B) n-propanol
(C) Butyl alcohol (D) Amyl alcohol
93. Which colour develops with THC spot on TLC plate when sprayed with Fast Blue B salt solution ?
- (A) Orange (B) Violet
(C) Red (D) Blue

94. The molecular formula of CBN (cannabinol) is :



95. The volatility of Hydrogen Cyanide is :

(A) 10 mg/m^3

(B) 5 mg/m^3

(C) 10 mg/m^2

(D) 10 mg/m^1

96. What is the ratio of relative concentration of alcohol in blood and urine ?

(A) 1 : 1.10

(B) 1 : 1.21

(C) 1 : 1.33

(D) 2 : 1

97. Hyoscine is an alkaloid found in :

(A) *Nux-vomica*(B) *Atropa*(C) *Aconite*(D) *Scopolamine*

98. The accurate and precised instrumental technique used for quantition of ethyl alcohol :

(A) GC-HS

(B) GC-MS

(C) HPLC

(D) HPTLC

99. The physiological active ingredient of cannabis is :
- (A) CBN (B) CBD
(C) THC (D) None of these
100. What is the use of diatoms earth in chromatography ?
- (A) Binder (B) Supportive material
(C) Active ingredient (D) None of these
101. Which oil has high tendency to spontaneous heating ?
- (A) Castor oil (B) Fish oil
(C) Mustard oil (D) Oleo oil
102. Flammable limit (%) of Butane is :
- (A) 5.3—14.0 (B) 3.0—12.5
(C) 1.9—8.5 (D) 4.0—75.0
103. Most suitable container for the storage of burned fire debris suspected of containing as fire accelerant is :
- (A) Glass jar (B) Plastic bag
(C) Paper bag (D) Tin dibba
104. Which form of phenolphthalein gives pink colour ?
- (A) Benzenoid form (B) Enolic form
(C) Quinoid form (D) None of these

105. What temperature the torch in ICP will have ?
- (A) 1000—2000 kelvin (B) 500—1000 kelvin
(C) 100—2000 kelvin (D) 8000—10000 kelvin
106. $[-N=N=N-]$ group belongs to which explosive compounds ?
- (A) Acetylene (B) Fulminates
(C) Organic Azides (D) Organic Chlorates
107. What is the decomposition temperature of RDX ?
- (A) 105°C (B) 280°C
(C) 213°C (D) 350°C
108. $C-N-NO_2$ group belongs to :
- (A) Nitro compounds (B) Nitrate esters
(C) Nitromines (D) None of these
109. 2, 4, 6 trinitrophenylmethylnitramine is the chemical name of :
- (A) Tetryl (B) Tetrazene
(C) PETN (D) Picric acid
110. Cyclotol is a mixture of :
- (A) TNT + PETN (B) TNT + Tetryl
(C) RDX + TNT (D) RDX + PETN

111. Engine lubricating oil consists of :
- (A) $C_5 - C_{10}$ hydrocarbons (B) $C_{18} - C_{28}$ hydrocarbons
(C) $C_{28} - C_{40}$ hydrocarbons (D) $C_{12} - C_{18}$ hydrocarbons
112. Which method is most suitable for the extraction of mercury from biological matrices ?
- (A) Dry ashing method
(B) Wet digestion or Acid digestion method
(C) Fresenius and Babo method
(D) Selective chemical treatment method
113. Legal's test is done for the identification of :
- (A) Formaldehyde (B) Acetone
(C) Methyl alcohol (D) Acetaldehyde
114. Opium falls under which class of poisons ?
- (A) Spinal (B) Cerebral
(C) Cardiac (D) Neurotic
115. *Calotropis procera* falls under which class of poisons ?
- (A) Irritant (B) Spinal
(C) Miscellaneous (D) Cardiac

116. Husemann's test is done for the identification of :
- (A) Calotropis
 - (B) Abrin
 - (C) Aconitum Alkaloids (Aconite alkaloids)
 - (D) Opium Alkaloids
117. Vital's test is done for the identification of :
- (A) Nerin
 - (B) Brucine
 - (C) Atropine
 - (D) Thevetin
118. What type of crystals are developed by morphine with 5% potassium iodide ?
- (A) Tufts
 - (B) Needle
 - (C) Orange plates
 - (D) Golden yellow needles
119. Curved ferns type of crystals are developed by :
- (A) Morphine + 5% Mercuric Chloride Sol.
 - (B) Strychnine + Gold Chloride Sol.
 - (C) Strychnine + Mercuric Chloride Sol.
 - (D) Morphine + Pot. Mercuric Iodide Sol.

120. In a suspected case of poisoning by strychnine, which organ should be preferred to preserve for toxicological analysis ?
- (A) Brain (B) Spleen
(C) Kidney (D) Liver
121. Cramps are caused by :
- (A) Cyanides (B) Excess of liquor
(C) Hyoscine (D) Lead
122. The molecular formula of heroin (Diacetylmorphine) is :
- (A) $C_{17}H_{19}NO_3$ (B) $C_{18}H_{21}NO_3$
(C) $C_{19}H_{21}NO_4$ (D) $C_{21}H_{23}NO_5$
123. Which one of the following drugs is present in *Papaver somniferum* plant ?
- (A) Theophylline (B) Pentazocine
(C) Thebaine (D) Pethidine
124. In Solid Phase Micro Extraction, what is the thickness of coating of stationary phase (polydimethylsiloxane) on SPME fibre ?
- (A) 50 μm (B) 60 μm
(C) 85 μm (D) 100 μm

125. The steps like dilution, extraction, filtering are used in :
- (A) Dry chemistry (B) Wet chemistry
(C) Phase chemistry (D) Process
126. Which spectrum is normally considered to be a specific means for identifying a chemical substance ?
- (A) Mass spectrum (B) IR spectrum
(C) UV spectrum (D) Visible spectrum
127. Spontaneous fires are caused by :
- (A) Carelessly discarded bidi/cigarette stubs or burning match sticks
(B) Short-circuiting
(C) Internal changes in the material
(D) Lightning
128. The Duquenois-Levine test is a valuable colour test for :
- (A) Opium (B) Cannabis
(C) *Nux-vomica* (D) Oleander
129. A system of personal identification using various body measurement was first devised by :
- (A) Edmond Locard (B) Mathieu Orfila
(C) Alphonse Bertillon (D) Leone Lattes

130. The blood of a drunken driver drawn to know the concentration of alcohol is preserved with :
- (A) Sodium Chloride (B) EDTA
(C) Sodium Fluoride (D) Phenylmercuric Nitrate
131. Structural formula of Alkane is :
- (A) C_nH_{2n} (B) C_nH_{2n+2}
(C) C_nH_{2n-2} (D) C_nH_{2n-1}
132. Fire mechanism is based on :
- (A) Oxidation (B) Reduction
(C) Redox (D) None of these
133. The lowest temperature at which a liquid gives off sufficient vapour to form a mixture with air that will support combustion ?
- (A) Ignition temperature (B) Flash point
(C) Flash over (D) Flash back
134. To recover high-explosive residues, debris recovered from the site of an explosion is routinely rinsed with :
- (A) Deionized water (B) Propanol
(C) Methanol (D) Acetone

135. On which principle does colour pattern of fire work ?
- (A) Electromagnetic force (B) Electromagnetic radiation
(C) Thermodynamics—3rd law (D) None of these
136. What is the unit of specific gravity ?
- (A) Gram (B) Gm/cc
(C) g/cm^3 (D) None of these
137. What is plotted in Mass-spectrum ?
- (A) Number of radical *vs.* time (B) Time *vs.* m/e
(C) Ion abundance *vs.* m/e (D) Time *vs.* Ion abundance
138. Aqua-regia solution contains :
- (A) $1\text{HNO}_3 + 3\text{HCl}$ (B) $3\text{HNO}_3 + 1\text{HCl}$
(C) $1\text{HNO}_3 + 1\text{HCl}$ (D) $2\text{HNO}_3 + 1\text{HCl}$
139. The collection of debris at the origin of a fire should include all :
- (A) Porous material
(B) Non-porous materials
(C) Porous and non-porous both materials
(D) None of the above

140. ECD is basically used for the detection of :
- (A) Hydrocarbons (B) Halides
(C) Nitrogenous compounds (D) Phosphated compounds
141. Which one is a primary explosive ?
- (A) RDX (B) ANFO
(C) TNT (D) PbN_3
142. Ammonium nitrate Fuel oil (ANFO) is equivalent to :
- (A) 60% TNT (B) 120% TNT
(C) 30% TNT (D) 80% TNT
143. The blasting grade ANFO prills contain :
- (A) 7% oxygen (B) 50% oxygen
(C) 35% oxygen (D) 20% oxygen
144. Which one of the following is a specific detector for organo-phosphorus compounds ?
- (A) FID (B) NPD
(C) ECD (D) HWD
145. The energy of photon is directly proportional to its :
- (A) Incident angle (B) Reflection angle
(C) Frequency (D) Absorption

146. The approximate concentration of ethyl alcohol in Sherry and Port wines is :
- (A) 5—8% (B) 40—60%
- (C) 15—20% (D) 95—97.5%
147. Which enzyme is responsible to convert the sugars into ethanol ?
- (A) Lypase (B) Peroxidase
- (C) Catalase (D) Zymase
148. The end product of methyl alcohol metabolism is :
- (A) Acetaldehyde (B) Formaldehyde
- (C) Acetic acid (D) Formic acid
149. What is the Anti-dote for methyl alcohol poisoning ?
- (A) Atropine (B) Ethanol
- (C) Nalmorphine (D) Caffeine
150. The *correct* method of preserving clothes stained with vomitus in a poisoning case is :
- (A) Air dried in shade and preserved
- (B) Sun dried and preserved
- (C) Preserved with sodium chloride solution
- (D) Immediately packed in a polythene bag