

S/SO/2013/05

FORENSIC SCIENCE & FORENSIC BALLISTICS

Roll No.						BOOKLET NO.	5013
Candidate should write his/her Roll No. in the box above. ↑						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.

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 λ_{max} 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 Ballistics)**

76. Recovery of firearm or related items such as bullets and cartridge cases indicates :
- (A) Corpus-Delicti
 - (B) Modus-Operandi
 - (C) Link between victim and suspect
 - (D) All of the above
77. Define Ballistics.
- (A) Ballistics is the science deals with Firearms
 - (B) Ballistics is the science deals with bullets
 - (C) Ballistics is the science deals with cartridges and bullets
 - (D) Ballistics is defined as the branch of science deals with motion and characteristic behaviour of projectiles and accompanying Phenomenon.
78. What is the technical name for the small pressure receptor charge in a gun ?
- (A) Firing pin
 - (B) Remote control
 - (C) Primer
 - (D) Cap
79. Any investigation involving firearm, the team usually include :
- (A) Firearm expert
 - (B) A medical expert
 - (C) A fingerprint expert
 - (D) All of these
80. Name of the shortest barrel firearm is :
- (A) Revolver
 - (B) Carbine
 - (C) Machine gun
 - (D) Pistol

81. Composition of Black powder is :
- (A) Potassium Nitrate (75%), Sulphur (10%) and Charcoal (15%)
 (B) Potassium Nitrate (65%), Sulphur (15%) and Charcoal (20%)
 (C) Potassium Nitrate (60%), Sulphur (25%) and Charcoal (15%)
 (D) Potassium Nitrate (75%), Sulphur (15%) and Charcoal (10%)
82. Choke in the firearm is introduced at :
- (A) Muzzle end of the barrel (B) Breech end of the barrel
 (C) Middle of the barrel (D) Whole barrel
83. Modern Muskets are :
- (A) Smooth bore shoulder weapon
 (B) Smooth bore hand weapon
 (C) Rifled shoulder weapon
 (D) Rifled hand weapon
84. The accuracy of the firearm can be greatly improved by making the barrel :
- (A) Shorter (B) Longer
 (C) Flatter (D) Thinner
85. Half Choke has the following degree of constriction in inch :
- (A) 40/1000 (B) 30/1000
 (C) 20/10001 (D) 15/1000
86. Choke in the firearm helps in :
- (I) Increase pattern density
 (II) Restrict the area of spread
- Codes :*
- (A) (I) is correct
 (B) (II) is correct
 (C) (I) and (II) are correct
 (D) Neither (I) nor (II) are correct

87. Mixed guns are :

- (I) Doubled barrel guns in which one barrel is of one bore and other is of different bore.
- (II) Doubled barrel guns having different chokes in both the barrels
- (III) Doubled barrel guns have one smooth bore barrel and other rifled barrel

Codes :

- (A) (I) is correct
- (B) (II) is correct
- (C) (III) is correct
- (D) (I) and (III) are correct

88. What is the effect of Rifling ?

- (I) Increase the stability
- (II) Increase the accuracy
- (III) Increase the effective range
- (IV) Decrease the effective range

Choose the *correct* answer from the codes given :

Codes :

- (A) (I) and (II) are correct
- (B) (I), (II) and (III) are correct
- (C) (I), (II), (III) and (IV) are correct
- (D) None of the above is correct

89. Spiral grooves in a gun barrel are referred to as :

- (A) Choke
- (B) Rifling
- (C) Smooth barrel
- (D) Barrel with spiral

90. What are Paradox Gun ?
- (A) Smooth bore weapon in which few inches of the bore towards muzzle end is rifled
 - (B) Smooth bore weapon in which few inches of the bore towards breech end is rifled
 - (C) Both breech and muzzle ends of barrel are rifled
 - (D) Weapon having different types choke at both the ends of barrel
91. The rifling of the barrel of a particular caliber is carried out with certain specifications :
- (A) Number of Lands and Grooves
 - (B) Direction of rifling
 - (C) Pitch of rifling
 - (D) All of the above
92. Which of the following statements is *true* :
- (A) All the firearms changes with the passage of time due to wear and tear and weathering action of atmosphere
 - (B) The above statement is true to fired or unfired ammunition
 - (C) Natural changes are ordinarily very slow and remained unnoticeable over long period
 - (D) All are correct
93. Cordite contains :
- (A) Nitroglycerine (58%), Nitrocellulose (37%) and Mineral Jelly (5%)
 - (B) Nitroglycerine (37%), Nitrocellulose (58%) and Mineral Jelly (5%)
 - (C) Nitroglycerine (95%) and Mineral Jelly (5%)
 - (D) Nitrocellulose (95%) and Mineral Jelly (5%)

94. Smokeless powder characterized by :
- (A) Bulk Powder
 - (B) Dense Powder
 - (C) Progressive powder
 - (D) All of the above
95. Which of the following can be tailor made to suit the ballistics of a particular firearm ?
- (A) Dense powder
 - (B) Bulk powder
 - (C) Progressive powder
 - (D) None of these
96. In percussion cap which of the following is used ?
- (A) Sodium sulphate
 - (B) Mercury fulminate
 - (C) Ammonium nitrate
 - (D) None of these
97. Cordite is used in :
- (A) .303 firearm
 - (B) .315 firearm
 - (C) 12 bore gun
 - (D) None of these
98. Core of the bullet is made up of :
- (A) Lead
 - (B) Aluminium
 - (C) Cobalt
 - (D) Nickel
99. Composition of the cartridge brass :
- (A) 70% Copper and 30% Zinc
 - (B) 70% Copper and 30% Nickel
 - (C) 70% Copper and 30% Iron
 - (D) 70% Copper and 30% Manganese

100. Chamber helps in :
- (A) providing space for expansion of cartridge case
 - (B) extraction
 - (C) ejection
 - (D) all of the above
101. Hammer is held in cocked position by :
- (A) A sear
 - (B) A lever
 - (C) Both (A) and (B)
 - (D) Neither (A) nor (B)
102. Pump action is used in :
- (A) Shotgun
 - (B) Revolver
 - (C) Both (A) and (B)
 - (D) Neither (A) nor (B)
103. Pump action is also called :
- (A) Slide action
 - (B) Trombone
 - (C) Both (A) and (B)
 - (D) Neither (A) nor (B)
104. In semi-automatic action :
- (A) Fired cartridge is extracted
 - (B) Fired cartridge is ejected
 - (C) New cartridge is loaded in the chamber
 - (D) All of the above
105. Recoil is produced by :
- (A) The gases produced
 - (B) Outgoing projectiles
 - (C) Utilizing part of the expanding gases
 - (D) All of the above

106. Greiss test is used to determine :
- (A) Nitrates (B) Nitrites
(C) Lead (D) Aluminium
107. Which of the following statements is *false* ?
- (A) Examination of tool marks has certain similarities to the examination of firearms
(B) In all the laboratories tool marks and firearms cases are handled in the same section
(C) The substantial part of the firearm examination consists of the study and comparison of tool marks left on the bullets and cartridge cases by various parts of the firearm
(D) Tool marks and firearms marks are compared under the comparison Microscope
108. Which of the following statements is *false* ?
- (A) Cartridge Designation are used to the manufacturer of the ammunition
(B) Cartridge Designation is basically the stamped markings
(C) Cartridge Designation is stamped at factory to indicate make and type
(D) Cartridge Designation does not tell about the size and configuration (Specifications)
109. Smokeless powder came into existence after :
- (A) 1800 (B) 1886
(C) 1900 (D) 1950
110. 12 bore gun barrel has diameter euqal to :
- (A) 0.935 (B) 0.835
(C) 0.729 (D) 0.637

111. Smooth bore is found in :
- (A) Rifle (B) Revolver
(C) Shotgun (D) Machine gun
112. Double base smokeless powder contains :
- (A) Potassium chlorate and arsenic sulphate
(B) Potassium nitrate and sulphur
(C) Nitrocellulose and Nitroglycerine
(D) Nitroglycerine and potassium chlorate
113. The deflection of bullet after striking an object is called :
- (A) YAW (B) Rechochete
(C) Obtusation (D) Tandom
114. Abrasion, Contusion and dirt color are characteristics of :
- (A) Contact range (B) Close range
(C) Long range (D) All of these
115. Soft nose bullet causes :
- (A) No injury (B) Minor injury
(C) Moderate injury (D) Extensive injury
116. The characteristic feature of .315 bullet is :
- (A) Sharp nose (B) Soft nose
(C) Round nose (D) Hollow nose
117. Extraction marks are seen on :
- (A) Rim Margin (B) Bullet
(C) Side of the Cartridge (D) Percussion cap
118. Hang fire is :
- (A) due to Higher Loading Density
(B) due to Lower Loading Density
(C) due to Improper Loading Density
(D) not at all due to Loading Density

119. Pressure in a firearm can be regularized by ;

- (A) Adjusting the length and strength of barrel
- (B) Adjusting size of primer
- (C) Adjusting the burning of powder
- (D) All of the above

120. (I) With 'Washing Effect', the gradual erosion and carrying away of the metal by the gases at high temperature.

(II) The 'Washing Effect', though slow ultimately loosens the barrel and affect both aim and range.

Codes :

(A) (I) is correct

(B) (II) is correct

(C) (I) and (II) are correct

(D) None of these is correct

121. Pressure developed in .303 rifle is of the order of :

(A) 3400 kg/cm²

(B) 500 kg/cm²

(C) 1000 kg/cm²

(D) 1500 kg/cm²

122. Pressure developed in shotgun is of the order of :

(A) 3400 kg/cm²

(B) 500 kg/cm²

(C) 1000 kg/cm²

(D) 1500 kg/cm²

123. Variation in the velocity of the projectile is due to :

(A) Atmospheric temperature

(B) Size of the primer pellet

(C) Density of loading

(D) All of these

124. Recoil in firearm is affected by :

(A) The forward motion of the ejecta (projectile, wads, powder and residual particles)

(B) The motion of the outrushing gases

(C) The muzzle blast (which pushes the firearm backward)

(D) All of the above

125. Trajectory of the projectile are affected by :
- (A) Air resistance (B) Gravitational pull of earth
(C) Both (A) and (B) (D) Neither (A) nor (B)
126. Twist (Turning) required depends upon :
- (A) The diameter of the projectile
(B) The length and density of the projectile
(C) The density of the medium through which the projectile move
(D) All of the above
127. Drift of the projectile in firearm depends upon :
- (A) The direction of the spin
(B) Whirling air
(C) Sideways jump of the barrel
(D) All of the above
128. Projectile movement suffer because of :
- (A) Skin Friction
(B) Base Drag
(C) Head Resistance
(D) All of the above
129. Base drag is minimum in :
- (A) Flat nose
(B) Blunt nose
(C) Cylindro-conoidal (standard)
(D) Boat tailed Bullet
130. The Ricochete bullet can strike :
- (A) Nose onward (B) Side onward
(C) Intermediate position (D) Any of these

131. Scorching/Burning/Charring is caused by :

- | | |
|-------------------|----------------|
| (I) Flame | (II) Hot gases |
| (III) Projectiles | (IV) Powders |

Choose the *correct* answer from the codes :

Codes :

- | | |
|-------------------------------|--------------------------------|
| (A) (I) and (II) are correct | (B) (III) and (IV) are correct |
| (C) (I) and (III) are correct | (D) (I) and (IV) are correct |

132. Tattooing is caused by :

- (A) Flame
- (B) Projectiles
- (C) Burnt powder
- (D) Embedding of unburnt and semiburnt powder particles

133. Peppering is also called :

- | | |
|----------------|---------------|
| (A) Blackening | (B) Burning |
| (C) Tattooing | (D) Scorching |

134. Metal particles travel :

- (A) Shorter distances than powder and smoke particles range
- (B) Equal distances than powder and smoke particles range
- (C) Longer distances than powder and smoke particles range
- (D) Almost distances than powder and smoke particles range

135. Whole charge in contact fire include :

- (A) Projectiles
- (B) Wads
- (C) Unburnt and semiburnt powder particles
- (D) Projectiles, wads, smoke, unburnt and semiburnt powder particles

136. In pistol the bullets are always :
- (A) Jacketed (B) Rimless
(C) Both (A) and (B) (D) None of these
137. Spread of pellet pattern are affected by :
- (A) The length of barrel of the firearm
(B) Muzzle end of the barrel
(C) Both (A) and (B)
(D) None of the above
138. Explosive wound is formed because of :
- (A) Vacuum created by the high velocity projectile
(B) Gyrotory motion of projectile is very high
(C) YAW
(D) All of the above
139. Wounding effect of a projectile depends upon :
- (A) Target site
(B) The velocity and the range of the firearm
(C) Both (A) and (B)
(D) None of the above
140. In close range firing which of the following is *not* present ?
- (A) Muzzle pattern
(B) Blackening
(C) Spreading of pellets and forming pattern
(D) Both (A) and (B)

141. Dynamite is manufactured with the help of :
- (A) Mercury fulminate (B) Nitroglycerine
(C) Ammonium nitrate (D) Potassium nitrate
142. Which of the following is a liquid explosive ?
- (A) RDX (B) PETN
(C) HMX (D) TATP
143. Which of the following is a plastic explosive ?
- (A) Nitroglycerine (B) TNT
(C) Nitrocellulose (D) RDX
144. ANFO contains :
- (A) Urea Nitric Acid
(B) Ammonium nitrate and ferric oxide
(C) Ammonium nitrate and glycerine
(D) Ammonium nitrate and Fuel oil
145. Imitating explosives are sensitive to :
- (A) Heat (B) Shock
(C) Friction (D) All of these
146. Which of the following is a high explosive ?
- (A) Picric acid (B) PETN
(C) Black powder (D) Mercury fulminate

147. High explosive detonates at the rate of :
- (A) 1000—8500 meter/sec. (B) 900—1000 meter/sec.
(C) 800—950 meter/sec. (D) 700—900 meter/sec.
148. Bomb made up of high explosive must be detonated by :
- (A) Non-initiating explosion (B) Initiating explosion
(C) Percussion cap (D) Black powder
149. Which of the following techniques provide a unique diffraction pattern of the inorganic constituents of the explosives ?
- (A) U.V. visible spectrophotometry
(B) Atomic Absorption Spectrometry
(C) X-ray diffraction
(D) Emission spectrography
150. Which of the following techniques provide a unique absorption spectrum for the organic explosives ?
- (A) I.R. Spectrophotometry
(B) U.V. visible spectrophotometry
(C) X-ray fluorescence spectrometry
(D) Atomic emission spectrometry