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Scientific Officer - II

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FSA2

Booklet Series **A**

Register Number

2010
FORENSIC SCIENCE

Time Allowed : 3 Hours] **[Maximum Marks : 300**

Read the following instructions carefully before you begin to answer the questions.

IMPORTANT INSTRUCTIONS

1. This Booklet has a cover (this page) which should not be opened till the invigilator gives signal to open it at the commencement of the examination. As soon as the signal is received you should tear the right side of the booklet cover carefully to open the booklet. Then proceed to answer the questions.
2. This Question Booklet contains **200** questions.
3. Answer **all** questions.
4. **All** questions carry equal marks.
5. The Test Booklet is printed in *four* series *e.g.* [A] [B] [C] or [D] (See Top left side of this page). The candidate has to indicate in the space provided in the Answer Sheet the series of the booklet. For example, if the candidate gets [A] series booklet, he/she has to indicate in the side 2 of the Answer Sheet with Blue or Black Ink Ball point pen as follows :

   [A] ■ [B] [C] [D]

6. You must write your Register Number in the space provided on the top right side of this page. Do not write anything else on the Question Booklet.
7. An Answer Sheet will be supplied to you separately by the Invigilator to mark the answers. You must write your Name, Register No. and other particulars on side 1 of the Answer Sheet provided, failing which your Answer Sheet will not be evaluated.
8. You will also encode your Register Number, Subject Code etc., with Blue or Black ink Ball point pen in the space provided on the side 2 of the Answer Sheet. If you do not encode properly or fail to encode the above information, your Answer Sheet will not be evaluated.
9. Each question comprises *four* responses (A), (B), (C) and (D). You are to select ONLY ONE correct response and mark in your Answer Sheet. In case you feel that there are more than one correct response, mark the response which you consider the best. In any case, choose ONLY ONE response for each question. Your total marks will depend on the number of correct responses marked by you in the Answer Sheet.
10. In the Answer Sheet there are **four** brackets [A] [B] [C] and [D] against each question. To answer the questions you are to mark with Ball point pen ONLY ONE bracket of your choice for each question. Select one response for each question in the Question Booklet and mark in the Answer Sheet. If you mark more than one answer for one question, the answer will be treated as wrong. *e.g.* If for any item, (B) is the correct answer, you have to mark as follows :

    [A] ■ [C] [D]

11. You should not remove or tear off any sheet from this Question Booklet. You are not allowed to take this Question Booklet and the Answer Sheet out of the Examination Hall during the examination. After the examination is concluded, you must hand over your Answer Sheet to the Invigilator. You are allowed to take the Question Booklet with you only after the Examination is over.
12. Failure to comply with any of the above instructions will render you liable to such action or penalty as the Commission may decide at their discretion.
13. Do not tick-mark or mark the answers in the Question Booklet.

Tear here

DO NOT TEAR THIS COVER OF THE QUESTION BOOKLET UNTIL YOU ARE ASKED TO DO SO

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1. The chemically erased writings can be deciphered by using

A) hand magnifier
B) stereoscopic microscope
C) electrostatic detection apparatus
D) video spectral comparator.

2. Match **List I** correctly with **List II** and select your answer using the codes given below the lists :

List I	List II
a) Normal phase	1. Hydrophobic small pore packing
b) Reverse phase	2. Silica packing
c) Ion exchange	3. C_{18} packing
d) Small molecules	4. Anion-cation exchange material.

Codes :

	a	*b*	*c*	*d*
A)	2	3	4	1
B)	1	2	3	4
C)	4	3	2	1
D)	3	2	1	4.

3. Any object that contains handwriting or typewriting and whose source or authenticity is in doubt is referred to as

A) questioned documents
B) disputed documents
C) anonymous documents
D) all of these.

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4. If two signatures of a person are exactly alike in dimensions then at least one of them is forged. It is referred to as

A) simulated forgery B) imitated forgery

C) freehand forgery D) traced forgery.

5. The drug used as antidote for opioid drug is

A) Pethidine B) Mandrax

C) Naloxone D) Morphine.

6. The flavour of beer is due to

A) Hops resin B) Yeast

C) Malt extract D) Ethanol.

7. Duquenois-Levin test is performed to identify

A) opium B) cannabis

C) organophosphorous pesticide D) oleander.

8. To determine the level of carbon monoxide in blood, the concentration of ..... is studied.

A) Haemoglobin B) WBC

C) Meth-Haemoglobin D) Carboxy Haemoglobin.

9. Molasses differ from other feed stocks such as corn, agave and potatoes for alcohol production in

A) being present as starch B) being present as alcohol

C) being present as sugars D) being present as cellulose.

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10. ..... is the bacteria which converts Ethanol to Ethanoic acid.

A) Yeast B) Acetobacter

C) Amylase D) Zymomonas.

11. Lysergic acid diethyl amide is synthesized from

A) opium alkaloids B) Rye ergot

C) cannabinol D) phenols.

12. The vomitus of highly unstable aconite is preserved in

A) acetic acid and rectified spirit (1 : 2)

B) acetic acid and formalin (1 : 2)

C) acetic acid and ether (1 : 2)

D) formic acid and rectified spirit (1 : 2).

13. Strychnine poisoning resembles

A) tetanus B) cocainism

C) datura poisioning D) organophosphorus poisoning.

14. Cocaine is obtained from

A) erythroxylum coca B) opium

C) cannabis D) none of these.

15. ..... is a strong inhibitor of acetylcholine esterase enzymes.

A) Organochloride pesticide B) Herbicides

C) Organophosphorous pesticide D) Fungicides.

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16. The active principle of Marihuana is

A) cannabidiol B) tetrahydrocannabinol

C) cannabinol D) cannabinoid.

17. Atomic absorption spectrometry has got a jet of compressed air, gas & sample solution through capillary tubes which is introduced in the instrument through

A) pump B) nebulizer or atomizer

C) furnace D) sprayer.

18. The common source for atomic absorption spectrometry is

A) bulbs B) hollow cathode lamps

C) lamps D) night bulbs.

19. Ultraviolet radiations can be used for

A) checking fake currencies B) identifying seminal stains

C) sterilization D) all of these.

20. Visualization of gunshot residues pattern exploits the fact that these patterns contain radio opaque particle such as bullet lead and uses which of the following best techniques ?

A) *X*-ray radiography B) Photography

C) Cinematography D) Polygraphy.

21. *X*-ray fluorescence spectrometry is useful for

A) qualitative and quantitative determination of elements

B) analysis of primer residues

C) shooter identification

D) all of these.

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22. The best Institute in India where neutron activation analysis can be done is

A) Central Forensic Science Laboratory, Chandigarh

B) Bhabha Atomic Research Centre, Trombay.

C) Central Forensic Science Laboratory, Kolkata

D) None of these.

23. In Atomic absorption spectroscopy which of the following events occur(s) ?

A) Evaporation of solvent leaving a solid residue

B) Solid dissociates into its atoms in ground state

C) Some atoms may be excited in the flame and attain a condition in which they radiate energy

D) All of these.

24. Prime factors for determining good colour prints are

I. Contrast

II. Colour balance

III. Graininess

IV. Illumination.

Of these

A) I alone is correct

B) I, II & III are correct

C) I & II are correct

D) II & IV are correct.

25. What is the colour temperature at the higher end (10000 K) of the Kelvin scale ?

A) Red

B) White

C) Blue

D) Yellow.

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26. A method to decipher a painted message in a case is

A) ultraviolet photography B) infrared photography

C) ultrafluorescence photography D) ultraviolet reflected photograpy.

27. A suitable method to photograph in detecting additions and alterations made in a forged document is

A) reflected UV photography B) fluorescent photography

C) infrared photography D) none of these.

28. 'Reversal processing' means

A) negative image is produced instead of positive

B) positive image is produced instead of negative image

C) no image is produced

D) none of these.

29. Non-colour sensitized film(s) is/are sensitive to

A) blue-violet regions B) ultraviolet regions

C) blue regions D) all of these.

30. Which angle produces the maximum effect using a polarizing filter ?

A) 90° B) 80°

C) 35° D) 10°

31. Among the following, which lens is used for document evidence photography ?

A) Macro lens B) Normal lens

C) Wide angle lens D) None of these.

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32. If an object is at a distance of 8 m, and you have a camera with maximum of f-22 then what is the maximum guide number which can be used to photograph the object ?

A) 30 B) 300

C) 176 D) 14.

33. The best method to study morphology of hair samples for comparative study is

A) photomicrograph B) photomacrograph

C) both (A) & (B) are correct D) both (A) & (B) are not correct.

34. A suitable method of illumination to photograph the impression made by the implement in a burglary case is

A) Direct light illumination B) UV light illumination

C) Oblique light illumination D) Scattered light illumination.

35. When a bullet penetrates a glass the effect(s) which can be seen predominantly is/are

A) a crater shaped hole

B) symmetric radial and concentric cracks

C) the hole is inevitably wider at the exit side

D) all of these.

36. Fractured window glass reveals the information on

A) the type of projectile used

B) the size of the projectile used

C) the force and direction of the projectile used

D) all of these.

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37. The crater shaped hole in glass on the side where the projectile has entered is

A) wider B) narrower

C) shallower D) no difference.

38. The comparison of glass pieces by 'immersion method' using refractive index as a physical property is done with

A) coconut oil B) silicone oil

C) sulphuric acid D) water and coconut oil.

39. The smaller lines perpendicular to the rib marks found at the fractured edges of the glass are called as

A) Linear marks B) Hackle marks

C) Griffith marks D) Stress marks.

40. Where there have been successive penetrations of glass, it is frequently possible to determine the sequence of impact

A) by observing the existing fracture lines and their points of termination

B) by observing the shape of the holes

C) by observing the size of the holes

D) by studying the rib and hackle marks at the cross-section of the fractured glass.

41. When a high-velocity projectile such as a bullet, penetrates a glass, it often leaves a

A) round, crater-shaped hole surrounded by a nearly symmetrical pattern of radial and concentric fractures

B) irregular hole surrounded by a nearly symmetrical pattern of radial and concentric fractures

C) round, crater-shaped hole surrounded by a nearly asymmetrical pattern of radial fractures

D) irregular hole devoid of radial or concentric fractures.

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42. The change in refractive index value for tempered and non-tempered glass, upon annealing, is

A) significantly greater
B) significantly lesser
C) almost nil
D) none of these.

43. Laminated glass used as windshields in automobiles is usually made by

A) sandwiching one layer of plastic between two pieces of ordinary window glass
B) sandwiching one layer of paper between two pieces of ordinary window glass
C) sandwiching a thin layer of iron mesh between two pieces of ordinary window glass
D) sandwiching a thin layer of sun control film between two pieces of heat resistant glass.

44. Which one of the following is useful to estimate the range of fire ?

A) Shot patterns
B) Wad distribution
C) Powder patterns
D) All of these.

45. When a shot is fired from an automatic pistol the empty shell

A) remains in the chamber
B) invariably be found at the scene
C) rarely found at the scene
D) will be shattered into pieces.

46. Wads are used in the cartridge

A) to keep the propellant and shot charge in their respective position
B) to prevent escape of gases from the barrel
C) to avoid reduction in velocity of projectiles
D) all of these.

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47. The ingredient in primer is

A) sulphur B) carbon

C) potassium nitrate D) lead azide.

48. Gyratory motion is referred to

A) the spinning motion of the projectile

B) the velocity of the bullet

C) the speed of ejection of fired cartridge case

D) the recoil of the gun.

49. The space between barrel and revolving cylinder in a revolver causes

A) leakage of gases and powder residues

B) reducing effectiveness of the fire arm

C) depositing residual powder on the hand of the shooter

D) all of these.

50. A mechanical mixture of potassium nitrate, charcoal and sulphur is called

A) black powder B) grey powder

C) semi-smokeless powder D) smokeless powder.

51. Pitch on angle of twist of a bore is measured by

A) helixometer B) spherometer

C) screw gauge D) vernier caliper.

52. Which one of the following is not a component of rifled cartridge ?

A) Primer B) Powder charge

C) Bullet D) Firing pin.

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53. Which of the following includes tyre markings, shoe prints, depressions in soft soils and all other forms of tracks ?

A) Explosions
B) Impressions
C) Both (A) & (B)
D) None of these.

54. Locating the physical evidence

A) needs same type of search methods for all the cases
B) needs trained persons to locate the material object
C) needs an inquiring mind and a searching eye
D) none of these.

55. The source of physical evidence in crime against property is

A) the scene of crime
B) the suspect
C) the environment
D) all of these.

56. Which one of the following is the most suitable method of handling a blood stained knife with few hairs ?

A) Holding a knife with its handle
B) Holding the knife with tips of index finger and thumb
C) Remove the hairs and handle the knife as usual
D) Hold the blade with the tips of index finger and thumb.

57. Which of following could be examined to link a person or object to a particular location ?

A) Soil and minerals
B) Tool marks
C) Paint
D) Hair and fibre.

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58. Mass spectrometry is the technique applied to find out

A) trace elements B) functional groups

C) molecular structure D) molecular weight.

59. To determine the molecular weights of organic compounds in complex mixtures which of the following instruments is considered as the best ?

A) Flame photometry

B) UV-spectrum meter

C) Gas chromatography and mass spectrometry

D) Atomic absorption spectrometry.

60. Major types of molecular vibrations are

A) stretching and bending B) push and pull

C) see-saw movement D) pull and push.

61. Fingerprint region in infrared spectrophotometer is

A) 1·3 — 0·91 cm^{-1} B) 13 — 9·1 cm^{-1}

C) 130 — 91 cm^{-1} D) 1300 — 910 cm^{-1}.

62. Wavelength range of visible region is

A) 400 nm — 500 nm B) 400 nm — 760 nm

C) 400 nm — 600 nm D) 400 nm — 550 nm.

63. The prism used in UV spectrophotometer is made up of

A) glass B) sodium chloride

C) quartz D) sand.

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64. The most unsuitable column used in HPLC to withstand heavy pressure is

A) glass capillary
B) 316 grade stainless steel
C) 10 cm to 25 cm long
D) 3 mm to 9 mm inner dia.

65. In high performance liquid chromatography, which component is not used ?

A) Mobile phase reservoir and solvent delivery system
B) Sample injection port and column
C) Detector & waste reservoir, computers & recorder
D) X-ray bulb.

66. For analysing pesticides the best detector that can be employed in gas chromatography is

A) flame ionization detector
B) nitrogen phosphorous detector
C) atomic emission detector
D) electrolytic conductivity detector.

67. Head space analyser is best used for which of the following analyses ?

A) Blood alcohol level analysis
B) Protein analysis
C) Carbohydrate analysis
D) Fat analysis.

68. In pre-coated thin layer chromatographic plates, the layers are supported by

A) glass
B) plastic sheets
C) aluminium foil
D) all of these.

69. The analysis time for thin layer chromatography is

A) 3 — 15 minutes
B) 3 — 15 seconds
C) 3 — 15 hours
D) 3 — 15 days.

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70. Match **List I** correctly with **List II** and select your answer using the codes given below the lists :

	List I		**List II**
a)	Shellac in alcohol	1.	Easy separation
b)	Talcum powder	2.	Hastening material
c)	Wire mesh	3.	Cohesion among the particles
d)	Common salt	4.	Reinforcing material

Codes :

	a	***b***	***c***	***d***
A)	4	3	2	1
B)	3	1	4	2
C)	3	2	4	1
D)	4	2	1	3.

71. In a firearm case, the bullet and cartridge cases were recovered. The correct procedure for marking the identification (initials) to be made by the I.O. on the seized item will be

A) initial the cartridge case on the base and the bullet on the sides

B) initial inside of the cartridge case near bullet end and initial the bullet on the base

C) both (A) & (B) are incorrect

D) both (A) & (B) are incorrect.

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72. In a theft wire case, you have collected the cut edges of the wire. Which of the following tools do you consider most appropriate for seizure and for comparing the cut edges of the wire connecting the accused with the crime ?

A) Hack-saw blade B) Cutting plier

C) Wrench D) Knife.

73. Chain of custody refers to transmission of material evidences from

A) court to forensic science laboratory

B) crime scene to court

C) forensic science laboratory to court

D) all of these.

74. A footwear abandoned at the scene of crime by a suspected accused can be marked or labelled in

A) sole B) insole

C) sides D) all of these.

75. Which is the most important specimen that can throw light on anti-mortem nature of the fire ?

A) Stomach B) Brain

C) Blood D) Liver.

76. When a bunch of cut hair is removed from scene of crime it is possible to ascertain

A) human or animal origin B) sex

C) age D) all of these.

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77. The rifled firearm involved in a shooting incident can be determined by

A) presence of rimfire cartridge

B) size and striations on outer surface of bullet

C) presence of land and grooves

D) all of these.

78. Arsenic metal poisoning is more evident by taking samples from

A) hair

B) nails

C) both (A) & (B) are incorrect

D) both (A) & (B) are correct.

79. The correct system to be followed for Gun Shot Residue (GSR) collection is

A) rubbing the right and left palms of the suspect with wooden shafted cotton swab with 5% nitric acid

B) rubbing the right and left palms of the suspect with plastic shafted cotton swab with distilled water

C) rubbing the right and left palms of the suspect with plastic shafted cotton swab with 5% nitric acid

D) all of these.

80. The order of steps to be followed by a forensic scientist in the scene of crime is

A) Recognition, Documentation, Collection and Preservation

B) Documentation, Recognition, Collection and Preservation

C) Preservation, Recognition, Documentation and Collection

D) Recognition, Preservation, Documentation and Collection.

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81. In genuine currency notes, the security thread is introduced

A) at the time of printing

B) at the time of manufacture of paper

C) after printing

D) before printing.

82. What should not be done to the recovered tool marks ?

A) To transport the tool to the laboratory

B) To make test tool marks at the crime scene

C) To take photographs of the tool

D) To protect the cutting portion of the tool.

83. Passing a jet of steam is to restore the obliterated marks on

A) plastics B) leather

C) wood D) stainless steel.

84. How are punched marks made ?

A) By engraving

B) By casting

C) By striking the metal surface with a die

D) By moulding.

85. Whether is it possible to restore a erased cast marks ?

A) Possible B) Sometimes possible

C) Always possible D) Not possible.

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86. Which tool may not make a compression mark ?

A) Hammers B) Punches

C) Dies D) Scissors.

87. A tool mark caused by a tool scraping over an object or surface softer than itself is

A) striated mark B) breech mark

C) bench mark D) sickle mark.

88. The better preservation of tool mark is

A) casting

B) photography

C) drawing

D) photography to scale followed by casting.

89. Fixing the size and shape of a tool by observing tool mark is

A) individual characteristics of the tool

B) class characteristics of the tool

C) independent characteristics of the tool

D) dependent characteristics of the tool.

90. Where does the term 'Forensic' come from ?

A) The Greek word 'forum' B) The Latin word 'forum'

C) The French word 'forum' D) None of these.

91. The first chemical examiner's laboratory was started at

A) Calcutta, 1953 B) Bombay, 1830

C) Madras, 1849 D) Agra, 1864.

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92. When was the 90% of Human Genome Project completed ?

A) July 26, 2001 B) June 26, 2000

C) May 26, 1999 D) April 26, 1998.

93. Which of the following cannot be used for DNA analysis ?

A) Blood stain B) Seminal stain

C) Urinary stain D) Salivary stain.

94. The branch of Forensic Science which deals with the identification of a dead body in an unrecognizable state using dental records is

A) Forensic Anthropology B) Forensic Pathology

C) Forensic Entomology D) Forensic Odontology.

95. Which of the following is the medical condition that occurs after death and results in the stiffening of muscle mass ?

The rigidity of the body gradually disappears 24 hours after death.

A) Rigor Mortis B) Livor Mortis

C) Autopsy D) Algor Mortis.

96. What is the use of the field instrument 'Intoxilyzer' ?

A) To determine the alcoholic consumption of an individual

B) To determine the sugar and alcohol consumption of an individual

C) To determine the poisonous gas consumption of an individual

D) To determine the blood pressure and sugar level.

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97. Which is the world's largest Forensic Science Laboratory ?

A) Central Investigation Agency

B) Central Forensic Science Laboratory

C) Federal Bureau of Investigation

D) None of these.

98. The French man who demonstrated how the principle enunciated by Gross could be incorporated within a workable laboratory, is

A) Edmond Locard B) Hans Gross

C) Albert S. Osborn D) Leone Lattes.

99. Who undertook the first definitive study of fingerprint and developed a methodology of classifying them for filing ?

A) Leone Lattes B) Alphonse Bertillon

C) Francis Galton D) Mathieu Orfila.

100. The Detective Novel 'A Study in Scarlet' was published in

A) 1887 B) 1886

C) 1885 D) 1884.

101. Laser detection of fingerprints is done with

A) argon laser B) continuous wave of argon laser

C) neon laser D) krypton laser.

102. Fingerprint loop pattern is subdivided into

A) radial loop and ulnar loop B) radius loop and ulnar loop

C) radial loop and ultimate loop D) restored loop and ulnar loop.

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103. In primary classification of fingerprints, the numerical value assigned to a whorl in right thumb is put in the

A) denominator B) numerator

C) left side D) right side.

104. In fingerprint, when there is a series of bifurcations opening towards the core at the point of divergence of type lines, which of the following is chosen as delta ?

A) The bifurcation outermost to the core

B) The bifurcation nearest to the core

C) The bifuraction to the left side of core

D) The bifurcation to the right side of core.

105. Which of the following is not a fingerprint classification formula division ?

A) Primary B) Secondary

C) Tertiary D) Subsecondary.

106. In primary classification of fingerprints, the numerical value assigned to a whorl in left middle finger is

A) 16 B) 8

C) 4 D) 2.

107. When the fingerprint of the right middle finger is scarred, it is given both the general type value, sub-classification value of

A) left middle finger B) right thumb

C) left thumb D) right index finger.

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108. The latent fingerprints developed with gold and red bronze powders are lifted on

A) black tape B) white tape

C) red tape D) yellow tape.

109. In silver nitrate method of developing fingerprints, it reacts with

A) sodium chloride in the fingerprint

B) sweat in the fingerprint

C) fat in the fingerprint

D) amino acid in the fingerprint.

110. Fingerprints dusted with metallic powders can be recorded by

A) emission spectrography B) absorption spectrography

C) emission electronography D) atomic absorption spectrometry.

111. Physical developer fingerprint processing solution contains among other things

A) Silver ions B) Copper ions

C) Gold ions D) Nickel ions.

112. The following are the sequences of examination and development of latent and bloody fingerprints on non-porous surfaces in crime scene. Identify the correct sequence.

A) Optical detection techniques, aluminium powder, iodine spray, diamino-benzidine

B) Optical detection techniques, iodine spray, aluminium powder, diamino-benzidine

C) Optical detection techniques, diaminobenzidine, iodine spray, aluminium powder

D) Optical detection, iodine spray, diaminobenzidine, aluminium powder.

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113. Latent fingerprint on cartridge cases can be developed by

A) silver nitrate B) sodium chloride

C) disodium hexapalladate D) physical developer.

114. The microscope which has the advantage of presenting a distinctive three-dimensional image of an object, is

A) comparison microscope B) compound microscope

C) stereo microscope D) polarizing microscope.

115. Empty magnification is referred to

A) increasing the total magnification beyond 1000 times the numerical aperture of the objective being used in a microscope

B) increasing the total magnification beyond 10 times the numerical aperture of the objective being used in a microscope

C) increasing the total magnification beyond 100 times the numerical aperture of the objective being used in a microscope

D) absence of objective lens in a microscope.

116. In compound microscope, the objective produces

A) a real image of an object

B) a virtual image of an object

C) an enlarged virtual image of an object

D) not an enlarged real image of the object.

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117. For obtaining a total magnifying power of 40X, a microscopist should use

A) an eyepiece of 10X in combination with an objective of 4X

B) an eyepiece of 10X in combination with an objective of 30X

C) an eyepiece of 10X in combination with an objective of 40X

D) an eyepiece of 5X in combination with an objective of 40X.

118. A type of image that cannot be viewed directly is called

A) virtual image

B) real image

C) image that is projected on to a motion picture camera

D) both (B) & (C).

119. 'Conoscopic observation' is possible in

A) petrographic microscope B) stereo microscope

C) binocular compound microscope D) scanning electron microscope.

120. Three-dimensional image can be obtained in

A) binocular compound microscopes

B) compound microscopes

C) stereo microscopes

D) both (A) & (C).

121. In Transmission Electron Microscope, the electrons used in forming the image

A) pass through the sample

B) do not pass through the sample

C) are scanned across the sample in a raster pattern

D) both (A) & (C).

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122. The purpose of explaining to the subject to be tested about the plans for a polygraph examination, a reasonable time in advance of the scheduled examination, is

A) to give truthful person a chance 'to cool off'

B) to increase the apprehension of detection on the part of a lying subject

C) to ally whatever apprehension a truthful person may have with respect to physical harm from the instrument attachments

D) all of these.

123. Reid polygraph is an instrument used for recording

A) change in blood pressure, pulse and respiration of a subject

B) the Galvanic Skin Reflex of a subject

C) certain muscular activity, particularly, muscular pressure exerted by the subject's body, forearms, thigh or feet

D) all of these.

124. The instrument which Cesare Lombroso used for detecting deception, was

A) hydrosphygmograph B) polygraph

C) polysomnograph D) galvanometer.

125. The instrument that measures physiological changes of the body that are triggered by emotional responses to specific verbal questions is called

A) brain mapping B) brain fingerprinting

C) narco-analysis D) polygraph.

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126. Where a person is in police custody or deprived of his freedom in any significant way by the police, he must be told, prior to any interrogation (i) that he had a right to remain silent; (ii) that anything he said could be used against him; (iii) that he had a right to a lawyer; and (iv) that if he could not afford a lawyer, one would be provided for him without costs. This procedure is referred to as

A) Miranda warnings
B) Rule of discovery
C) General rejection rule
D) General inadmissibility rule.

127. The chief source of energy for the production of speech sound is

A) expiratory air
B) inspiratory air
C) blood pressure
D) either (A) or (B).

128. An instrument that converts speech into a visual graphic display is called as

A) sound spectrograph
B) video spectral comparator
C) UV-VIS spectrograph
D) either (A) or (B).

129. The polygraph is a technique used for

A) detecting deception
B) detecting lies
C) obtaining information from an uncooperative suspect
D) extracting information from the brain.

130. Phonetics is a subject that studies

A) how humans speak
B) how the speech is transmitted acoustically
C) how the speech is perceived
D) all of these.

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131. In a voice spectrogram one can observe

A) voice bars
B) resonance bars
C) silence/pause
D) all of these.

132. The effective speaker recognition may not be possible due to

A) the recording of control speech samples after months or years after the disputed utterance was made
B) incooperative attitude of the suspect to obtain control speech samples in supposed psychological conditions of the disputed utterance
C) the recording of the control speech samples within a month after the disputed utterance was made
D) (A) and/or (B).

133. The average fundamental frequency of vibration of the vocal cords, for children, is

A) equal to that of males
B) lesser than that of males
C) greater than that of males and females
D) lesser than that of females.

134. The average fundamental frequency of vibration of the vocal cords, for males, is between

A) 180 Hz and 300 Hz
B) 300 Hz and 600 Hz
C) 90 Hz and 140 Hz
D) 900 Hz and 1600 Hz.

135. Footprint impressions in blood on non-porous surface can be enhanced by

A) amido black
B) diaminobenzene
C) protein dye with 5-sulphosalicylic acid
D) protein dye.

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136. Consider the following statements :

I. The weight of the person has a great deal of influence on the rate of wear

II. The manner in which a person walks also influences the wear

III. The sex and body type of the wearer also can play a role in the wear

IV. The occupation and habit of the wearer can also have impact on shoe wear.

Of these statements :

A) I alone is correct

B) I & II are correct

C) I, II & III are correct

D) all are correct.

137. Footwear random characteristic means

A) intentional characteristics

B) characteristics that depend upon chance

C) characteristics specified during manufacture

D) characteristics that are present on a new shoe.

138. Carbon paper can be used for lifting footwear residue impressions

A) if the impression is tightly bound to the surface

B) if the impression is not tightly bound to the surface

C) if the impression is wet

D) if the impression is dry.

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139. Consider the following statements :

I. It is normal for gait characteristics to vary within the same individual

II. The gait characteristics change with increased speed of walking

III. Gait characteristics will not vary within the same individual

IV. There is no change in gait characteristics with increased speed of walking.

Of these statements

A) I alone is correct
B) I & II are correct
C) I, II & III are correct
D) all are correct.

140. Which one of the following is used as a releasing agent in footprint casting process ?

A) Talc powder
B) Shellac
C) Plaster of Paris
D) Dental stone.

141. Impressions of wet origin on dirty surfaces are lifted with

A) Plaster of Paris
B) dental stone
C) commercial gelatin materials
D) transparent tapes.

142. β-calcium sulphate hemihydrate is commonly known as

A) Plaster of Paris
B) dental stone
C) silicone
D) alginates.

143. The stones' compression strength ranges from

A) 100 to 500 PSI
B) 500 to 1000 PSI
C) 1200 to 2000 PSI
D) 8000 to 15000 PSI.

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144. Front tyre stance is

A) the distance between front axle and rear axle

B) the distance between centre to centre of front tyres

C) the distance between front left tyre and rear right tyre

D) the distance between road surface and top of tyre.

145. The type of two-dimensional impression that occurs when a footwear deposits material on to a surface is

A) positive impressions B) negative impressions

C) surface impressions D) sunken impressions.

146. Gait characteristics of a person are

A) individual characteristics

B) class characteristics

C) neither individual nor class characteristics

D) random characteristics.

147. When a vehicle hits a tree head on, the occupants of the vehicle will move

A) backward with reference to the direction of impact

B) forward with reference to the direction

C) sidewards with reference to the direction

D) upwards with reference to the direction.

148. In motor vehicle accident cases paint smear at the point of contact is

A) light and thin B) heavier

C) strong and thick D) lighter.

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149. In motor vehicle accidents wheel 'lock up' shows

A) skid mark B) yaw mark

C) collision mark D) acceleration mark.

150. A skid mark depends on factors including

A) history of the motor-cycle B) type and conditions of the tyres

C) conditions of road surface D) all of these.

151. In vehicular accidents paint smear along the direction of contact is heavier due to

A) dragging B) heat and friction

C) force D) collision.

152. To bring the vehicle to stop one has to

A) reduce the kinetic energy of the vehicle to zero

B) convert kinetic energy to some other than energy

C) convert kinetic energy into another type of energy

D) all of these.

153. The conservation of energy law shows that

A) the total energy of the system at the beginning of the process is not equal to the total energy of the system at the end of the process

B) the total energy of the system at the beginning of the process is equal to the total energy of the system at the end of the process

C) both (A) & (B)

D) none of these.

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154. Cross-section of multilayered paint flakes indicate

A) the number of layers of paint
B) the colour of each layer
C) soil and debris inclusion
D) all of these.

155. The metallic paints in automobiles contain

A) iron
B) lead
C) aluminium
D) nickel.

156. In case of examination of typewritten documents, examination is possible because of

A) the wear and tear of the typewriter
B) the make and model of the typewriter
C) typed by inexperienced typist
D) all of these.

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157. While obtaining the standard or request writing from the accused

A) he should be shown the questioned document
B) he should be provided with instructions to spell
C) he should be corrected in his punctuations
D) none of these.

158. Forged signatures may be

A) traced
B) simulated
C) simple forgery
D) all of these.

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159. Which one of the following is not a rifled firearm ?

A) Revolver B) Pistol

C) Shotgun D) Sten gun.

160. Which of the following features is most likely to differ in forged writing from the genuine writing ?

A) Pictorial effect B) Slope of letters

C) Average size of letters D) Fine quality.

161. The most preferred method used for the detection of 'GSR' particles, in terms of composition of elements and shape and size of the particles, is

A) X-ray fluorescence spectrometry

B) atomic absorption spectrophotometry

C) scanning electron microscopy with energy dispersive X-ray analyser

D) neutron activation analyser.

162. Sample application technique depends on

A) qualitative analysis & quantitative analysis

B) work load & time

C) type of separation layer & sample volume

D) all of these.

163. 'Polymerase chain reaction' relates to'

A) Isoenzyme studies

B) Haptoglobulin studies

C) DNA typing studies

D) Electrophoresis studies.

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164. Jumping genes are also called as

A) Pseudogenes
B) Microsatellites
C) Minisatellites
D) Transposons.

165. The genetic material consists of

A) nucleic acids
B) amino acids
C) protein molecules
D) adenosine triphosophate.

166. While investigating a case of sexual assault on a post-pubescent virgin girl you observe blood drops at the scene of crime and recover blood stained clothing from the victim and accused because

A) blood stain evidence would be useful to substantiate violence
B) in the absence of seminal stains, blood stain would not be sufficient to prove sexual assault
C) even in the absence of seminal stains, blood stain would be sufficient to prove the charge of sexual assault if epithelial cells are located in the blood stains
D) blood stain would be useful in establishing the scene of crime beyond doubt.

167. Antibodies are carried in the

A) Serum
B) Plasma.
C) Red Blood Cells
D) White Blood Cells.

168. Precipitin test is also specific for

A) blood
B) tissues
C) seminal fluid
D) all of these.

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169. The shape of blood droplets striking a surface at 90° on smooth hard surface will be

A) oval B) elongated

C) circular D) irregular.

170. The physical evidence, 'Blood' from the crime scene has

A) class characteristics

B) special characteristics

C) class and individual characteristics

D) group characteristics.

171. When a blood drop falls, it produces elliptical shape when the angle of incidence is beyond

A) 30° B) 40°

C) 50° D) 60°

172. The carrier gas used in gas chromatography is

A) nitrogen B) phosphene

C) arsine D) zero air.

173. The refractive index of glass is about

A) 1·50 B) 1·33

C) 0·15 D) 1·03

174. Revolver is

A) rifled hand gun B) smooth bored hand gun

C) muzzle loading firearm D) a sporting firearm.

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175. The carrier gas for gas chromatography — mass spectrometer is

A) Helium B) Carbon dioxide

C) Ammonia D) Chlorine.

176. Morphology of air comprises

A) bulb, shaft, tip B) medulla, pigments, tip

C) bulb, cortex, root D) tip, cuticle, cortex.

177. Human premolars are termed as ..... by dentists.

A) single cuspid B) bisucpid

C) tricuspid D) none of these.

178. Fibres for microscopic examination should be washed with

A) ether B) ethanol

C) xylene D) xylocaine.

179. The strongly pigmented hair may best be studied after

A) washing with acid B) taking longitudinal section

C) taking cross-section D) scanning electron microscope.

180. Femoral head is present in

A) radius B) humerus

C) femur D) fibula.

181. Death is caused in Judicial hanging due to fracture dislocation of

A) C_3 C_4 C_5 vertebrae B) C_2 C_3 C_4 vertebrae

C) C_1 C_2 C_3 vertebrae D) C_4 C_5 C_6 vertebrae.

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182. Synthetic fibres can be examined by

A) Pyrolysis GC B) Gas chromatograph

C) HPLC D) TLC.

183. How many bones are present in each human foot excluding seassamoid bones ?

A) 26 B) 22

C) 24 D) 25.

184. Smart bomb is essentially

A) an ordinary bomb with usual fuse and explosive material

B) an electronic sensor and a built-in control system

C) a set of adjustable flight fins and a battery

D) all of these.

185. Percussion cap contains

A) Gun powder B) mercury fulminate

C) PETN D) NGNC.

186. A time bomb which is operated by a clock mechanism may explode

A) within 24 hours B) within 12 hours

C) within 60 minutes D) within 60 seconds.

187. The primary explosive is

A) Lead azide B) NGNC

C) Tetryl D) Black powder.

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188. The preliminary test done to identify the explosive substance in the scene of crime is

A) Spot test
B) Ion scan - 400
C) X-ray
D) Laboratory test.

189. Crater formation is significant of

A) high explosive
B) low explosive
C) cracker composition
D) gas cylinder explosion.

190. 1, 3, 5 trinitro 1, 3, 5 triazo cyclohexane is

A) TNT
B) Tetryl
C) RDX
D) HMX.

191. Double-base smokeless powder is/are

A) Liquid explosive
B) ANFO
C) NC + NG (Nitrocellulose + Nitroglycerine)
D) Acetylene gas + Air mixture.

192. An I.E.D. is of

A) service pattern
B) any size or any shape
C) designed by military personnel
D) ballistically shaped device.

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193. Dogs can sniff accelerants efficiently by

A) taking longer duration of time

B) covering small areas in short time

C) covering large areas in short time

D) by giving multiple breaks.

194. The mass of flame that detached from the fire and rise into the air is called

A) pyrolysis B) fireball

C) flash point D) none of these.

195. A chemical transformation in which heat energy is liberated, is referred to as

A) exothermic reaction

B) endothermic reaction

C) heat of combustion

D) explosion.

196. A substance that supplies oxygen to a chemical reaction is

A) reducing agent B) oxidizing agent

C) accelerant D) catalyst.

197. The minimum temperature at which a fuel burns is referred to as

A) spark temperature B) starting temperature

C) ignition temperature D) primary temperature.

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198. A rug soaked in linseed oil is an example of

A) exothermic reaction
B) endothermic reaction
C) spontaneous ignition
D) all of these.

199. A typical burn pattern resulting from the use of liquid acclerants is called

A) spalling
B) incendiarism
C) puddling
D) both (A) & (B).

200. Thermochemistry is the study of

A) how heat is propagated during chemical reaction
B) how heat is generated during chemical reaction
C) how heat is radiated during chemical reaction
D) all of these.

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