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003653

Test Booklet Series

Booklet Serial No.

TEST BOOKLET - 2022

SCIENTIFIC OFFICER SEROLOGY

(21)

A

Time Allowed: Two Hours

Maximum Marks: 120

INSTRUCTIONS

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6. All items carry equal marks.
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10. **Penalty for wrong answers:**
THERE WILL BE PENALTY FOR WRONG ANSWERS MARKED BY THE CANDIDATE.
 - (i) There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, **0.25** of the marks assigned to that question will be deducted as penalty.
 - (ii) If a candidate gives more than one answer, it will be treated as a **wrong answer** even if one of the given answers happens to be correct and there will be same penalty as above for that question.
 - (iii) If a question is left blank, i.e., no answer is given by the candidate, there will be no **penalty** for that question.

SEAL

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21(A)/2022

[P.T.O.]

003883

1. When one enters into some place, he takes some things from and leaves some things there is given under :
 - A) Principle of exchange
 - B) Principle of comparison
 - C) Principle of analysis
 - D) Law of prograssive change

2. "There can be no better analysis than the sample analysed" is the principle of :
 - A) Law of progressive change
 - B) Principle of analysis
 - C) Law of probability
 - D) Law of circumstantial facts

3. The dirt and rocks present on murder victim can be examined under the field of :
 - A) Forensic Geology
 - B) Forensic Physics
 - C) Forensic Biology
 - D) Forensic chemistry

4. Application of comparison microscope for the analysis of bullets is given by
 - A) Leone lattes
 - B) Albert Osborn
 - C) Calvin Goddard
 - D) Francis Galton

5. In which country the first fingerprint bureau was established :
 - A) China
 - B) USA
 - C) London
 - D) India

6. Which method/s is/are used for the recording of crime scene?
- A) Notes
B) Photography
C) Sketching
D) All of the above
7. CCD are the sensors used in :
- A) Camera
B) Metal detectors
C) Scanners
D) None of the above
8. Tread marks, if found, can be classified as _____ crime scene
- A) Macroscopic
B) Microscopic
C) Indoor
D) Outdoor
9. The place which the culprit had used for the making of bomb can be classified as
- A) Indoor crime scene
B) Outdoor crime scene
C) Primary crime scene
D) Secondary crime scene
10. The area surrounding the actual crime scene can be categorised under
- A) Outdoor
B) Macroscopic
C) Indoor
D) Primary
11. Which of the following is not an ethical practice in forensic science?
- A) Unbiased examination
B) Achieving competency
C) Giving opinion in every matters even beyond expertise
D) Present accurate and complete data.

12. Examination and handling of cases involving family and friends, falls under the category of
- A) Conflict of interest
 - B) Lack of competency
 - C) Tampering evidences
 - D) Presentation of inaccurate data
13. Black powder is an example of _____ explosive?
- A) Molecular
 - B) Composite
 - C) Initiator
 - D) All the options
14. Glass pieces become very important evidence in cases of
- A) Murder
 - B) Homicide
 - C) Arson
 - D) Burglary
15. In the manufacturing of glasses, Selenium is used as
- A) Formers
 - B) Stabilizers
 - C) Colorants
 - D) Refining agents
16. Microscopic examination can be performed for the analysis of
- A) Fibers
 - B) Soil
 - C) Glass
 - D) All of the above
17. If a Crime scene is present in a residential area, which method is preferred for the search of crime scene?
- A) Zonal method
 - B) Spiral method
 - C) Strip method
 - D) All of the above

18. Sign of struggle can be found on death body in the cases of

- A) Murder
B) Homicide
C) Suicide
D) Both A and B

19. If the pool of blood is found at crime scene then _____ can be used for the collection of blood?

- A) Pipetting
B) Swabbing
C) Vacuuming
D) None of the above

20. Drag marks and teeth marks are the types of?

- A) Biological evidences
B) Impression evidences
C) Pressure evidences
D) Odonatological evidences

21. Selecting every 10th house for sampling is called

- A) Sequential sampling
B) Systematic sampling
C) Stratified sampling
D) Random sampling

22. The square - root of the average of squares of deviations, when such deviations for the values of individual items in a series are obtained from the arithmetic average is called as

- A) Mode
B) Median
C) Standard deviation
D) Mean

23. Which of the following is a non - parametric test?

- A) T-test
B) ANOVA
C) Linear regression
D) Chi square

31. Opinions of expert is given under
- A) Section 45 of IPC B) Section 293 of IPC
C) Section 45 of IEA D) Section 3 of IEA
32. An expert witness is an ordinary person who
- A) Was involved in the case
B) Is knowledgeable about a specific field
C) Has knowledge about the facts of the case at hand
D) Is trained in the law
33. Which of the following is a part of endomembrane system of eukaryotic cell?
- A) Golgi complex B) Chloroplast
C) Mitochondria D) Peroxisomes
34. Three morphological forms fo Golgi complex are :
- A) Granum, thylakoids and vesicles
B) Lamellae, tubules and vesicles
C) Cisternae, tubules and vesicles
D) Cisternae, tubules and lamellae
35. Extra nuclear genes are found in :
- A) Nucleus and mitochondria
B) Lysosome and Chloroplast
C) Mitochondria and chloroplast
D) Golgi body and Endoplasmic reticulum

36. An organelle with an internal cross section showing characteristic "9+2" morphology is:
- A) Cytoskeleton
 - B) Microtubule
 - C) Microfilament
 - D) Cilium or Flagellum
37. Features of eukaryotic cells not found in prokaryotes :
- A) Complex cytoskeletal system
 - B) Plasma membrane
 - C) Shared metabolic pathways
 - D) Proteasomes
38. Which of these statements is generally true to integral membrane proteins?
- A) They are unusually susceptible to degradation by trypsin.
 - B) The domains that protrude on the cytoplasmic face of the plasma membrane nearly always have covalently attached oligosaccharides.
 - C) They can be removed from the membrane with high salt or mild denaturing agents
 - D) A hydropathy plot reveals one or more regions with a high hydropathy index.
39. Who coined the term mitochondrion?
- A) Camillo Golgi
 - B) Carl Benda
 - C) Schimper
 - D) Schleicher
40. Who discovered and named the endoplasmic reticulum?
- A) Keith Roberts Porter
 - B) Behrens
 - C) Eduard Strasburger
 - D) Schleicher

41. The type of coiling in DNA is :
- A) Opposite
 - B) Right - handed
 - C) Left - handed
 - D) Zig - zag
42. Which of the following enzymes separates the two strands of DNA during replication?
- A) DNA polymerase
 - B) Topoisomerase
 - C) Gyrase
 - D) Helicase
43. Association of histones H1 with nucleosome shows :
- A) The condensation of DNA into chromatin fibre
 - B) The occurrence of replication
 - C) Exposed DNA double helix
 - D) The occurrence of transcription
44. The bases are held together in a DNA double helix by hydrogen bonds. These bonds are :
- A) Vander Waals forces
 - B) Non - covalent bonds
 - C) Covalent bonds
 - D) Ionic bonds
45. Name the protein, which is used for termination of replication?
- A) SSB
 - B) DNA polymerase
 - C) Tus protein
 - D) DnaC
46. Which of the following would relax negatively supercoiled DNA?
- A) Collagen
 - B) DNA gyrase
 - C) Elastin
 - D) Topoisomerase I

47. Which of the following best describes the polysomes?
- A) Active site for synthesis of proteins
 - B) Active site for synthesis of DNA
 - C) Active site for synthesis of lipids
 - D) All of these
48. In protein synthesis, translocation is initiated with the movement of :
- A) tRNA from A-site to P-site
 - B) tRNA from P-site to E-site
 - C) Dipeptidyl tRNA from A-site to P-site
 - D) tRNA from P-site to the A - site
49. Which of the following drug inhibits the initiations step of translation?
- A) Tetracycline
 - B) Streptomycin
 - C) Cyclohexylamine
 - D) Ricin
50. Who proposed the wobble hypothesis?
- A) Samuel B. Weiss
 - B) Nirenberg
 - C) Darwin
 - D) Watson and Crick
51. Which of the following is an example of amphoteric molecule?
- A) Sugars
 - B) Acetic acid
 - C) Water
 - D) Malic acid
52. In presence of an acid, amino group can be :
- A) Washed away
 - B) Polarized
 - C) Protonated
 - D) Replaced
53. What is the full form of pH?
- A) Proton of hydrogen
 - B) Positron
 - C) Positive hydrogen
 - D) Potential Hydrogen

54. A solution having a pH of 6 has a proton concentration of :
- | | |
|-------------|----------------|
| A) 0.6M | B) 10^{-6} M |
| C) 10^6 M | D) 6 M |
55. Apoenzymes dissociates from co-enzymes due to
- | |
|--------------------------------------|
| A) Change in substrate concentration |
| B) Change in pH |
| C) Change in temperature |
| D) Change in inhibitor concentration |
56. Normal blood pH is :
- | | |
|--------|--------|
| A) 8.4 | B) 7.2 |
| C) 7.4 | D) 7.3 |
57. Buffers react with _____ ions.
- | | |
|-----------------------|-----------------------|
| A) Magnesium, Calcium | B) Sodium |
| C) Potassium | D) Hydrogen, Hydroxyl |
58. Carbonic acid and bicarbonate ions buffer which of the following?
- | | |
|--------------|------------|
| A) Cytoplasm | B) Cytosol |
| C) Blood | D) Lymph |
59. The wound made by a surgeon is known as
- | | |
|---------------------|--------------------|
| A) Iatrogenic wound | B) Defend wound |
| C) Incised wound | D) Offensive wound |
60. Cutis anserina of rigor mortis due to stiffness of
- | | |
|--------------|--------------------|
| A) Cremaster | B) Biceps |
| C) Diaphragm | D) Erector pilorum |

61. Tattoo marks destroyed ; their presence can be inferred from presence of pigment in
- A) Deep dermis
 - B) Subcutaneous tissue
 - C) Lymph nodes Regional
 - D) Underlying Muscle
62. Morbid jealousy is seen with
- A) Alcoholism
 - B) LSD addiction
 - C) Dementia
 - D) Schizophrenia
63. The following wounds will heal without a scar formation
- A) Laceration
 - B) Abrasion
 - C) Stab wound
 - D) Chop wound
64. A dead body for autopsy is to be preserved in a cold chamber whose preferred temperature is
- A) -4°C
 - B) 0°C
 - C) 4°C
 - D) 10°C
65. The shape of cooling curve pattern of a human cadaver is
- A) Parabola
 - B) Ascending
 - C) Descending
 - D) Sigmoid
66. Acro - reaction test helps to identify a
- A) Exit wound of filigree burn
 - B) Exit wound of joule burn
 - C) Entry wound of joule burn
 - D) Entry wound of filigree burn
67. Which of the following specimen was chosen by Mendel for his experiment?
- A) Pisumsativum
 - B) Drosophila
 - C) Fly
 - D) Rat

68. What is an allele?
- A) Alternate forms of genes
 - B) Characteristics of an organism
 - C) Homologous chromosomes
 - D) Pair of centrioles
69. Mark the INCORRECT statement about mutation?
- A) Major source of evolution
 - B) It is a reversible process
 - C) Usually deleterious and recessive
 - D) Mutation is predestined
70. Which of the following chemical mutagen affects only replicating DNA?
- A) Alkylating agent
 - B) Acridine dye
 - C) Deaminating agent
 - D) Base analog
71. Name the term given to the type of mutation which depends on the conditions of the environment?
- A) Conditional lethal mutation
 - B) Reverse mutation
 - C) Forward mutation
 - D) Gain of function mutation
72. Which of the following statements is NOT true regarding linkage group?
- A) Linkage groups are not correlated with each other
 - B) Shown by linkage map
 - C) Group of physically linked genes
 - D) Represent a haploid number of chromosomes
73. What is the maximum percentage of recombination frequency between two genes?
- A) 100%
 - B) 75%
 - C) 50%
 - D) 25%

74. Two genes are 70 cM apart, calculate the recombination frequency?
- A) 50%
 - B) 100%
 - C) 25%
 - D) 23%
75. The length of Amelogenin Locus in X-Chromosome is
- A) 112 bp
 - B) 110 bp
 - C) 114 bp
 - D) 106 bp
76. The chromosome pattern in Turner's syndrome is
- A) XXY
 - B) XXX
 - C) XYY
 - D) XO
77. The term "stutter" is usually used for DNA fragments that are
- A) Three repeat unit shorter than the expected band
 - B) Five repeat unit shorter than the expected band
 - C) One repeat unit shorter than the expected band
 - D) Two repeat unit shorter than the expected band.
78. Which of the following is not a thermostable polymerase?
- A) Vent polymerase
 - B) DNA polymerase III
 - C) Taq polymerase
 - D) Pfu polymerase
79. Why are vent polymerase and Pfu more efficient than the Taq polymerase?
- A) Because of more efficient polymerase activity
 - B) Because of proof reading activity
 - C) Both A and B
 - D) None of the above

80. Which of the following is true for asymmetric PCR?
- A) Used for generating single - stranded copies for DNA sequence
 - B) Used for generating double - stranded copies for DNA sequence
 - C) Both A and B
 - D) None of the above
81. Which of the following are electrophoretic artifacts?
- A) Pull - Up Peaks
 - B) Allelic Dropout
 - C) Spikes
 - D) Both A and C
82. Which of the following are compound repeat STRs?
- A) FGA
 - B) VWA
 - C) D2S441
 - D) All of the above
83. STR with repeat motif GATA is :
- A) D7S820
 - B) D12S391
 - C) D18S51
 - D) TPOX
84. Among the following locus, select the pair of STR and SNP loci :
- A) TPOX and FGA
 - B) D7S820 and D7S8
 - C) LDLR and GYPA
 - D) GC and HBGG

85. Which of the following SNP loci is used for Hair color identification?

- A) MC1R
- B) KCNH2
- C) SCN5A
- D) None of the above

86. The most common polymorphic regions of the human mtDNA is :

- A) HV1 and HV2
- B) HV1 and HV3
- C) HV2 and HV3
- D) HV1

87. Anti - H lectin is prepared from the seed of

- A) Ulexeuropaeus
- B) Semecarpusanacardium
- C) Dolichosbiflorus
- D) Ricinuscommunis

88. Prostate - specific antigen is also called as

- A) Amylase
- B) Ptylase
- C) P30
- D) Protease

89. The most common approach for the identification of faeces is

- A) Ptylin
- B) Glycogen
- C) Creatin
- D) Urobilinogen

90. FTA card can be used in

- A) Confirmatory test of blood
- B) Collection and storage of blood
- C) Digestion of DNA
- D) Ligation of DNA

91. Blood types are determined by
- A) Antibodies present in the plasma
 - B) Antigens on the RBC membrane
 - C) Glycoproteins on the RBC membrane
 - D) By exposure to intestinal bacteria during infancy
92. Which of the following is not a red cell blood group system?
- A) HLA
 - B) ABO
 - C) Kell
 - D) Duffy
93. MALT stands for
- A) Mucosal associated lymph terminal
 - B) Muscular associated lymph tissue
 - C) Muscular associated lymph terminal
 - D) Mucosal associated lymph tissue
94. Acid phosphatase in male is secreted by
- A) Islets of Langerhans
 - B) Thyroid gland
 - C) Pituitary gland
 - D) Prostate gland
95. A person with Bombay blood group contains
- A) A but not B antigen
 - B) B but not H antigen
 - C) None of A, B and H antigen
 - D) All A, B and H antigen
96. Which among the following is dimeric in nature
- A) IgG
 - B) IgA
 - C) IgM
 - D) IgD

97. Erythroblastosisfetalis occurs, when
- A) Premature Rh positive baby is given a transfusion of Rh negative blood
 - B) The fetus cannot make normal red blood cells
 - C) Anti - Rh antibodies from the maternal circulation cross the placenta and agglutinate the fetal red blood cells.
 - D) The fetus white blood cells are destroyed by antibodies from the maternal circulation.
98. Which of the Ig can pass through placenta and provide immunity to new born
- A) IgG
 - B) IgA
 - C) IgM
 - D) IgD
99. The antibody - binding site is formed primarily by the
- A) Constant regions of H and L chains
 - B) Hyper variable regions of H and L chains
 - C) Hyper variable regions of H chains
 - D) Variable regions of H chains
100. Which one of the following is expressed on antigen - presenting cell surface?
- A) IgE
 - B) Class I MHC antigens.
 - C) Class II MHC antigens
 - D) Interferon
101. Which is wrong for both Kastle - Meyer and tetra methyl benzidine test?
- A) Both are presumptive test for blood
 - B) Both test use H_2O_2
 - C) Both tests are based on color change
 - D) Both test leads to crystal formation

102. Peroxidase like activity in tetramethyl benzidine test is exhibited by

- A) Albumin of blood
- B) Iron of hemoglobin
- C) Globulin of blood
- D) Glacial acetic acid

103. Which of the following statement(s) is/are wrong?

- A) Antigens of the ABO blood group are proteins
- B) Antigens of the Rh blood group are sugars
- C) A but not B
- D) Both A and B

104. Which of the following test is used to determine the species of origin from blood stain?

- A) Acid phosphate
- B) Immunoprecipitation
- C) Fluorescence
- D) Teichmantest

105. Which of the following tests is not a catalytic color test for blood stain?

- A) Luminol test
- B) O-toulidine
- C) Tetramethyl benzidine
- D) Teichmann test

106. Luminol test can be used as

- A) Confirmatory test for blood
- B) Presumptive test for blood
- C) Both of above
- D) None of above

107. Jaffe test is used to detect

- A) Blood
- B) Saliva
- C) Urine
- D) Semen

108. What color is observed in Jaffe test?

- A) Blue to deep black
- B) Dark purple
- C) Green to light red
- D) Braun to orange

109. Which test is used to detect semen sample in case of azoospermia?

- A) P30 test
- B) Picric acid test
- C) Litmus test
- D) Jaffe test

110. α - naphthyl phosphate and Brentamine Fast Blue is used to test

- A) Creatinine
- B) Haemoglobin
- C) Amylase
- D) Acid Phosphatase

111. Alternate light source can be used to detect

- A) Blood
- B) Saliva
- C) Semen
- D) All of above

112. Idiotypic determinants arise from the

- A) Sequence of the heavy and light chain variable regions
- B) Sequence of the light chain variable regions
- C) Sequence of the heavy and light chain constant regions
- D) Sequence of the constant chain variable regions

113. Endogenous antigens are processed through

- A) Endocytic pathway
- B) Cytosolic pathway
- C) Catalytic pathway
- D) Positive feedback pathway

114. Western blotting is used to detect

- A) Lipid
- B) Sugar
- C) DNA
- D) Protein

115. Which of following body fluid shows the presence of Fibrin Degradation products?

- A) Menstrual blood
- B) Peripheral blood
- C) Nasal secretion
- D) Vomit

116. Which among the following is true about Kastle - Meyer test?
- A) Reduced phenolphthalein gives pink color
 - B) Oxidized phenolphthalein gives green color
 - C) Oxidized phenolphthalein gives pink color
 - D) Reduced phenolphthalein gives purple color
117. Which components of blood is responsible for haemin crystals in Teichmann test?
- A) Albumin and Globulin,
 - B) Protoporphyrin ring of hemoglobin
 - C) PGM and RBC
 - D) Neutrophils of blood
118. Which among the following is not true for thymus
- A) It is site of T-cell development and maturation
 - B) It is a primary lymphoid organ
 - C) It is consisting of cortex and medulla
 - D) Its size increases with age
119. 96 well plates are used in
- A) Western blotting
 - B) Southern blotting
 - C) ELISA
 - D) IEF
120. Which among the following antibody shows highest avidity
- A) IgG
 - B) IgE
 - C) IgD
 - D) IgM

ROUGH WORK

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