084/2024

Maximum : 100 marks

Time : 1 hour and 30 minutes

1. The optical path within cuvette is always :

(A) 10 mm (B) 1 mm

(C) 1 cm (D) Both (A) and (C)

2. Insoluble solid can be removed from a liquid by :

(A) Analysis (B) Filtration

(C) Distillation (D) Titration

3. Find the correct pair regarding Colour code for Biomedical waste collection bag :

(i) Black : Body parts

(ii) Red : Contaminated Plastic

(iii) White : Sharps

(iv) Yellow : Placenta

(A) (i) and (iii) (B) (ii) and (iv)

(C) (ii) and (iii) (D) Both (B) and (C)

4. Find the Carcinogenic chemical :

(A) Selenite (B) Nitrosamine

(C) Benzidine (D) All of the above

5. Most common causes of electrical hazard, the laboratory staff should be aware of is :

(A) Long flexible electrical connecting cables

(B) Electrical equipment left switched off

(C) Cables are insulated

(D) Electrical cords are as short as possible

6. Reagents with accurate concentrations can be made using :

(A) Erlenmeyer Flask (B) Conical Flask

(C) Volumetric Flask (D) Round bottomed Flask

7. The following is not true about deionised water :

(A) High purity than Distilled water (B) Neutral pH

(C) High Electrical Conductivity (D) Need not be sterile

8. The cleaning of Culture plates after use include the following steps in order :

1. Rinse thoroughly with tap water
2. Autoclaving 30 minutes at 121 °C
3. Brush with detergent and water
4. Dry
5. Pour out the contents of media
6. Rinse with distilled water

(A) 2, 5, 1, 3, 4, 6
(B) 2, 5, 3, 1, 6, 4
(C) 1, 2, 5, 3, 6, 4
(D) 1,2, 3, 4, 5, 6

9. The main responsibilities of Laboratory professional, include all except :

(A) Give Medical Advice and necessary medical treatment to patients
(B) Participate in Quality Assurance and Improvement of Laboratory Service
(C) Confidentiality of Patient Medical Information
(D) Present Laboratory results to Clinicians

10. First aid for minor burns don't include :

(A) Protect area with sterile non adhesive bandage
(B) Apply ice or butter
(C) Don't break blisters
(D) Take a counter pain reliever

11. The 'blue top' vacutainer tube contains which anticoagulant?

(A) Sodium fluoride
(B) Sodium citrate
(C) Heparin
(D) EDTA

12. Drabkin's reagent is used for haemoglobin estimation. It contains :

(A) Sodium ferricyanide, Sodium dihydrogen phosphate, Potassium cyanide
(B) Potassium ferrocyanide, Potassium hydrogen – phosphate, Sodium cyanide
(C) Potassium ferricyanide, Potassium dihydrogen – phosphate, Potassium cyanide
(D) None of these

13. Internal diameter of a capillary haematocrit tube is :

(A) 1 cm
(B) 0.1 mm
(C) 0.2 mm
(D) 1 mm

14. In automated blood cell counters, which method uses light scattering and fluorescence to analyse the blood cells?

(A) Flow cytometry
(B) Electrical impedance
(C) Radio frequency analysis
(D) Hydrodynamic – focusing

15. Leishman's stain is used to stain blood cells routinely. The primary mechanism of action of Leishman's stain on blood cells is :

(A) It disrupts cell membrane
(B) It modifies cell surface receptors
(C) It interacts with proteins in the cytoplasm
(D) It interacts with nucleic acids in the cell

16. Macrophages play a crucial role in phagocytosis, tissue repair etc. The blood cell which is modified into macrophages in tissue is :

(A) Neutrophil
(B) Monocyte
(C) Basophil
(D) Lymphocyte

17. Which condition may be indicated by an increased reticulocyte count?

(A) Haemolytic anaemia
(B) Aplastic anaemia
(C) Pernicious anaemia
(D) Iron deficiency anaemia

18. In which all hypersensitivity reactions do eosinophilia is seen :

(A) Type I and Type II hypersensitivity reactions
(B) Type II and Type III hypersensitivity reactions
(C) Type II and Type IV hypersensitivity reactions
(D) Type I and Type IV hypersensitivity reactions

19. Which of the following is true with the Bombay blood group?

(A) H gene is present
(B) H gene is absent
(C) H substance is formed
(D) Seen in subgroups of A blood group

20. A negative result in the indirect Coomb's test suggest :

(A) The presence of antigens on red blood cells
(B) The presence of antibodies in the recipient's serum
(C) The absence of antibodies in the recipient's serum
(D) The absence of antigens on red blood cells

21. Both naturally occurring and immune antibodies may or may not bind complement. All the main blood group antibodies bind complement, except :

(A) Rh antibodies
(B) anti A
(C) anti B
(D) Both anti A and anti B

22. Name the coagulation test which is prolonged in a patient with haemophilia :

(A) D-dimer test
(B) Thrombin time
(C) Prothrombin time
(D) Activated partial-thromboplastin time

23. Westergren's method is used to find Erythrocyte sedimentation rate. The working distance of the Westergren's tube used in this test is :

(A) 100 mm
(B) 150 mm
(C) 200 mm
(D) 250 mm

24. The sperm count below 15 million/ml of semen is termed as :

(A) Azoospermia
(B) Polyzoospermia
(C) Oligospermia
(D) Zoospermia

25. Which condition is indicated by the presence of high levels of protein in the urine?

(A) Diabetes Mellitus
(B) Hyper Tension
(C) Glomerulo nephritis
(D) Urinary Tract Infection

26. Blood in sputum is termed as :

(A) Haemoptysis
(B) Haemophilia
(C) Haematuria
(D) Hemostasis

27. The presence of fat globule in the stool is indicative of :

(A) Hepatitis
(B) Appendicitis
(C) GERD
(D) Malabsorption Syndrome

28. Presence of Neutrophils in CSF indicates :

(A) Viral meningitis
(B) Jaundice
(C) Polio
(D) Bacterial meningitis

29. The Anticoagulant of choice for blood sugar estimation is :

(A) Sodium citrate
(B) Sodium fluoride
(C) EDTA
(D) Heparin

30. The commonly used tumor marker for prostate cancer is :

(A) Prostate - specific antigen
(B) Alpha - feto protein
(C) CA - 125
(D) CEA

31. The marker used to differentiate between cardiac and skeletal muscle damage is :

(A) Troponin I
(B) Myoglobin
(C) CK-MB
(D) LDH

32. The elevated alkaline phosphatase is seen in :

(A) Haemolytic anaemia
(B) Hyper thyroidism
(C) Diabetes mellitus
(D) Bone disease

33. The type of cholesterol commonly termed as good cholesterol is :

(A) LDL (B) THDL
(C) HDL (D) VLDL

34. The normal value of sodium level in serum is :

(A) 80-110 mEq/L (B) 20-40 mEq/L
(C) 200-300 mEq/L (D) 135-145 mEq/L

35. The hormone which regulates metabolism, heart rate and body temperature :

(A) Thyroid hormone (B) Cortisol
(C) Insulin (D) Glucagon

36. The test provides an average blood glucose level over the past 2-3 months is :

(A) HbsAg (B) HbA1C
(C) GTT (D) GCT

37. POCT stands for :

(A) Patient Of Care Testing (B) Point Of Care Testing
(C) Part Of Care Testing (D) Pulmonology of Care Testing

38. The colorimeter works under the principle of :

(A) Beer's Lambert's Law (B) Kirchoff's Law
(C) Newton's Law (D) Charle's Law

39. Which shape describes bacteria with helically twisted cylinders?

(A) Bacillus (B) Spirochaete
(C) Coccus (D) Vibrio

40. Liquid paraffin can be sterilised by :

(A) Hot air oven (B) Autoclave
(C) Inspissator (D) Waterbath

41. ———— is a clearing agent used in tissue processing.

(A) Acetone (B) Alcohol
(C) Paraffin Wax (D) Water

42. Which is the instrument used to cut frozen sections?

(A) Rocking microtome (B) Wax bath
(C) Cryostat (D) Cryofuge

43. The counter stain that can be used in Gram's stain :

(A) Dilute carbol fuschin (B) Safranine

(C) Neutral red (D) All of the above

44. Cerebral malaria is caused by :

(A) Plasmodium ovale (B) Plasmodium vivax

(C) Plasmodium falciparum (D) Plasmodium malariae

45. A diagnostic technique used for very early detection of cancer :

(A) Biopsy (B) Radiation

(C) FNAC (D) Surgeory

46. Which is the nuclear stain used in Papanicolau staining?

(A) Harri's Haematoxylin (B) Orange G6

(C) EA36 (D) EA65

47. RPR test is used for the serodiagnosis of :

(A) Typhoid (B) Syphilis

(C) AIDS (D) IMN

48. Which of the following is not a method for anaerobic culture of bacteria?

(A) McIntosh Fildes jar (B) Gaspak system

(C) Alkaline pyrogallol method (D) Clot culture

49. Filarial worms inhabit which part of the human body?

(A) Intestine (B) Liver

(C) Brain (D) Lymph nodes

50. The tissue embedding medium used in electron microscopy is :

(A) Paraffin wax (B) Bees wax

(C) Starch (D) Epoxy resin

51. 'Candela' is the SI unit of which fundamental quantity?

(A) Electric Current (B) Temperature

(C) Luminous Intensity (D) Amount of Substance

52. A particle of mass 'm' is moving in a Uniform Circular motion with constant speed 'v' along a circle of radius 'r'. The acceleration of the particle is :

(A) Zero (B) $\frac{v^2}{r}$

(C) $\frac{v}{r^2}$ (D) $\frac{mv^2}{r}$

53. The frictional force required to keep the solid object on its surface at rest is called?

(A) Static friction (B) Kinetic friction
(C) Rolling friction (D) Sliding friction

54. The variation of acceleration due to gravity with height from the surface of the earth is that :

(A) Increases with increase in height (B) Decreases with increase in height
(C) Remains constant (D) None of the above

55. The statement, "The pressure in a fluid at rest is the same at all points if they are at the same height" represents which of the following?

(A) Boyle's Law (B) Bernoulli's principle
(C) Archimedes Principle (D) Pascal's law

56. The Celsius scale temperature corresponding to 212°F in the Fahrenheit scale is :

(A) 0 °C (B) 100 °C
(C) 212 °C (D) 273 °C

57. The period of oscillation of a second's pendulum is :

(A) 1 second (B) 2 seconds
(C) 10 seconds (D) 60 seconds

58. Among the following statements about electric field lines select the correct option :

(i) They start from positive charge and end in negative charge.
(ii) Two electric field lines can never cross each other.
(iii) Electric field lines do not form any closed loops.

(A) (i) and (ii) are correct (B) (i) and (iii) are correct
(C) (ii) and (iii) are correct (D) All the statements are correct

59. The magnetic field inside a long solenoid of length 'L' and number of turns 'N' and carrying current I will be :

(A) Zero (B) $\frac{\mu_0 n I}{2}$
(C) $\mu_0 n I$ (D) $\mu_0 N I$

60. Which electromagnetic radiation plays an important role in maintaining the Earth's warmth through the greenhouse effect?

(A) UV rays (B) Infrared Rays
(C) Gamma Rays (D) Radio waves

61. Which of the following is the most electrically conductive element?

(A) Silver (B) Lead
(C) Hydrogen (D) Aluminium

62. A ray of light passes from medium 1 to medium 2. If no refraction occurs, then the angle between the incident light and surface of separation should be :

(A) 45° (B) 120°
(C) 180° (D) 90°

63. Which of the following mirror is used as rear view mirror in vehicles?

(A) Convex mirror (B) Concave mirror
(C) Plane mirror (D) Cylindrical mirror

64. The main application of Zener diode is :

(A) Amplification (B) Multi vibration
(C) Rectification (D) Voltage regulation

65. Name the series of Hydrogen spectrum corresponds to visible region :

(A) Balmer series (B) Lyman series
(C) Paschen series (D) Pfund series

66. A solution contains 0.5 moles of solute in a 2 litres of solution. What is the molarity of the solution?

(A) 0.25 M (B) 1 M
(C) 2.5 M (D) 0.125 M

67. For an electron in a 4s orbital what are the possible values of the angular momentum quantum number I :

(A) 1 (B) 0
(C) 2 (D) 3

68. During charging of a Lead Storage cell which electrode undergoes the Oxidation reaction :

(A) Lead Electrode (B) Oxygen Gas Electrode
(C) Hydrogen Gas Electrode (D) Lead Dioxide Electrode

69. Which of the following term is an example of a lyophobic colloid?

(A) Gelatin (B) Starch
(C) Sulphur (D) Gum Arabic

70. Which of the following elements has the highest ionization enthalpy in the second period of modern periodic table?

(A) Li (B) Be
(C) B (D) C

71. Which of the following equation depicts the reducing nature of hydrogen peroxide?

(A) $2Fe[(CN)_6]^{4-} + 2H^+ + H_2O_2 \rightarrow 2[Fe(CN)_6]^{3-} + 2H_2O$

(B) $I_2 + H_2O_2 + 2OH^- \rightarrow 2I^- + 2H_2O + O_2$

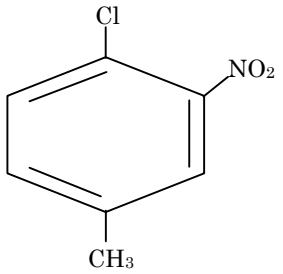
(C) $Mn^{2+}H_2O_2 \rightarrow Mn^{4+} + 2OH^-$

(D) $PbS + 4H_2O_2 \rightarrow PbSO_4 + 4H_2O$

72. Hyponatremia refers to a condition characterized by :

(A) High levels of sodium in the blood
(B) Low levels of calcium in blood
(C) Normal levels of sodium in the blood
(D) Low levels of sodium in the blood

73. The IUPAC name for :



(A) 1-chloro-2-nitro 4-methyl benzene
(B) 1-chloro 4-methyl 2-nitrobenzene
(C) 2-chloro 1-nitro 5-methyl benzene
(D) m-nitro p-chloro toluene

74. Which pair of compounds gives Tollen's test?

(A) Glucose and Fructose
(B) Sucrose and Glucose
(C) Hexanal and Acetophenone
(D) Fructose and Sucrose

75. The commercial name of poly acrylonitrile is :

(A) Orlon
(B) PVC
(C) Bakelite
(D) Dacron

76. Which of the following reagents can be used to oxidise primary alcohols to aldehydes?

1. CrO_3 in anhydrous medium
2. $KMnO_4$ in acidic medium
3. Pyridinium Chlorochromate
4. Heat in the presence of Cu at 573 K

(A) 1
(B) 1, 2
(C) 1, 2, 4
(D) 1, 3, 4

77. Which of the following is an example for analgesic?

(A) Ranitidine
(B) Aspirine
(C) Penicillin
(D) Bithional

78. The discovery of fullerenes led to the development of which significant area in materials science :

(A) Superconductors (B) Nanotechnology
(C) Polymers (D) Photovoltaic

79. Which of the following is not a transition metal?

(A) Vanadium (B) Gold
(C) Copper (D) Thallium

80. Which step is not involved in decomposition?

(A) Leaching (B) Stratification
(C) Catabolism (D) Fragmentation

81. Name the enzyme used to break the bacterial cell for DNA isolation :

(A) Pectinase (B) Chitinase
(C) Cellulase (D) Lysozyme

82. Name the part that guide the entry of pollen tube into the embryo sac / female gametophyte is :

(A) Synergid (B) Egg
(C) Filiform apparatus (D) Antipodals

83. Which one of the following pair is correct?

(i) Elaioplast – Store oil/fat
(ii) Amyloplast – Store carotenoid
(iii) Aleuroplast – Store protein

(A) Both (i) and (iii) (B) Both (ii) and (iii)
(C) Both (i) and (ii) (D) Only (iii)

84. Single cotyledon present in Maize seed is called :

(A) Epiblast (B) Scutellum
(C) Hypocotyl (D) Perisperm

85. Which pest is controlled by cryIAb gene of *Bacillus thuringiensis*?

(A) Corn borer (B) Cotton bollworms
(C) Armyworm (D) Budworm

86. Name the new breed of sheep produced in Punjab by crossing Bikaneri ewes and Marino rams :

(A) Nellore (B) Hisardale
(C) Marwari (D) Mecheri

87. Which type of synovial joint allows for the rotational movement between the Atlas and Axis vertebrae?

(A) Hinge Joint
(B) Ball and Socket Joint
(C) Pivot Joint
(D) Gliding Joint

88. What is the effect of ADH on blood vessels, and how does this influence Kidney function?

(A) Vasodilation; decreases GFR
(B) Vasoconstriction; increases blood pressure and GFR
(C) Vasodilation; increases GFR
(D) Vasoconstriction; decreases blood pressure and GFR

89. In which method is the ovum collected from a donor transferred into the fallopian tube of another female?

(A) Artificial Insemination
(B) In Vitro Fertilisation
(C) Gamete Intra Fallopian Transfer
(D) Intra Cytoplasmic Sperm Injection

90. Which feature is NOT typically associated with Down's Syndrome?

(A) Broad palm with palm crease
(B) Short stature
(C) Mental retardation
(D) Gynaecomastia

91. Which class of Satellite DNA is specifically used in DNA finger printing due to its high degree of polymorphism?

(A) Microsatellite
(B) Minisatellite
(C) Alu sequences
(D) Long Interspersed Nuclear Elements

92. Which characteristic is NOT typical of Cancer cells?

(A) Uncontrolled Cell Division
(B) Loss of Contact Inhibition
(C) Formation of Benign tumors only
(D) Ability to invade surrounding tissues

93. Which of the following Phyla show radial symmetry?

(A) Porifera
(B) Coelenterata
(C) Annelida
(D) Mollusca

94. In a club, 60 men play cricket 30 play tennis and 15 play both cricket and tennis. How many play at least one of these two games?

(A) 60 (B) 70
(C) 72 (D) 75

95. If $A=\{x, y, z\}$ $B=\{1,2\}$ then the number of relations from A into B is :

(A) 64 (B) 63
(C) 36 (D) 54

96. Which of the following function describe an 'onto' function?

(A) Let $A=\{1,2,3,4,5\}$ and $f:A\to A$ is defined by $\{(1,3),(2,5),(3,5),(4,2),(5,3)\}$

(B) Let $A=\{-1,1\}$ and $f:A\to A$ is given by $f(x)=x^2$

(C) Let $A=\{-1,1\}$ and $g:A\to A$ is given by $g(x)=x^3$

(D) None of these

97. How many terms of the Arithmetic progression 1, 4, 7,.... are needed to give the sum 715?

(A) 22 (B) 25
(C) 30 (D) 31

98. What is the value of $2\sin^2 30 - 3\cos^2 45+\cos^2 60$?

(A) $\frac{3}{4}$ (B) $\frac{-3}{4}$
(C) $\frac{1}{2}$ (D) $\frac{-5}{4}$

99. What is the equation of the ellipse whose vertices are at $(5,0)$, $(-5,0)$ and foci at $(4,0),(-4,0)$?

(A) $25x^2+9y^2=225$ (B) $5x^2+3y^2=15$
(C) $9x^2+25y^2=225$ (D) $3x^2+5y^2=15$

100. Find the equation of the line that has x-intercept –3 and is perpendicular to $3x+5y=4$:

(A) $3x+5y+9=0$ (B) $3x-5y-9=0$
(C) $5x-8y-45=0$ (D) $5x-3y+15=0$

SPACE FOR ROUGH WORK

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