MIZORAM PUBLIC SERVICE COMMISSION

COMMON COMPETITIVE EXAMINATION FOR GROUP 'B' NON-GAZETTED (TECHNICAL)

LABORATORY TECHNICIAN UNDER H&FW DEPARTMENT, GOVERNMENT OF MIZORAM, NOVEMBER-2024

PAPER-IV (TECHNICAL SUBJECT)

Time Allowed: 2 hours FM: 100

All questions carry equal mark of 1 each.
Attempt all questions.

1. The first vascular response to injury is-
   (a) Slowing of the circulation
   (b) Venular dilatation
   (c) Capillary enlargement
   (d) Arteriolar vasoconstriction
2. Regarding chronic inflammation which of the following is false?
   (a) It is associated with persistent infections
   (b) It primarily involves tissue destruction
   (c) It may contribute to the formation of atherosclerosis
   (d) It may be caused by exposure to toxic agents
3. The first event in acute inflammation is-
   (a) Arteriolar vasodilation
   (b) Increased permeability
   (c) Arteriolar vasoconstriction
   (d) Stasis
4. Cancer cells-
   (a) Do not undergo apoptosis
   (b) Play a part in mitosis
   (c) Undergo mitosis
   (d) Play a part in steroid - hormone production
5. Hyperplasia generally means-
   (a) An organ will increase in size due to excessive formation of extracellular fluids
   (b) Increased cell production in a normal tissue
   (c) Shrinkage in cell size
   (d) Blebbing at the periphery
6. Necrosis is-
   (a) Reversible
   (b) Non-reversible
   (c) Lack of oxygen to the tissue
   (d) Tissue regeneration
7. Cytotoxic T- cells can be activated via which of the following?
   (a) By reacting with budding viruses
   (b) By identifying budding peptides presented by antibodies
   (c) By identifying virus peptides presented by MHC - I
   (d) By releasing complement

8. All of the following are features of apoptosis except:
   (a) Cell swelling
   (b) Chromatin condensation
   (c) Lack of inflammation
   (d) Phagocytosis of apoptotic bodies

9. Choose the correct statement regarding hypertrophy:
   (a) Occurs after partial hepatectomy
   (b) Increases function of an organ exponentially
   (c) Is usually pathological
   (d) Is triggered by mechanical and tropical chemicals

10. All of the following malignant tumours metastasize except:
   (a) Synovial sarcoma
   (b) Malignant mesothelioma
   (c) Glioma
   (d) Neuroblastoma

11. Which of the following cells are involved in cell-mediated immunity?
   (a) T-cells
   (b) Mast cells
   (c) B-cells
   (d) Leukemia

12. Which piece of equipment is needed when working with acids, bases and open flames?
   (a) Beaker
   (b) Safety googles
   (c) Electronic balance
   (d) Burette

13. The main cell type that produces CSF is-
   (a) Astrocyte
   (b) Basket cell
   (c) Ependymal cell
   (d) Schawnn cell

14. How many sperm analysis are needed to confirm sterility or fertility?
   (a) 2
   (b) 4
   (c) 1
   (d) 3

15. In amoebic dysentery, the pH of stool is-
   (a) Acidic
   (b) Alkaline
   (c) Neutral
   (d) both a and c

16. The normal amount of protein present in urine is-
   (a) >200mg
   (b) < 150 mg
   (c) 500-1500 mg
   (d) > 1000 mg

17. A black coloured sputum is an indication of-
   (a) Presence of pus and epithelial cells
   (b) Pseudomonas infection
   (c) Rupture of vessel
   (d) Inhalation of dirt

18. Which of the following solid waste describes the term "Municipal solid waste"?
   (a) Toxic
   (b) Hazardous
   (c) Non-toxic
   (d) Non-hazardous

19. False positive test for haematuria on urinalysis may occur due to-
   (a) Myoglobin
   (b) Glomerulonephritis
   (c) Urinary tract infection
   (d) Red cell carcinoma

20. Interferons are secreted by-
   (a) Liver
   (b) Spleen
   (c) Virus infected cells
   (d) Lymphocytes

21. What is the primary function of neutrophils in the immune system?

(a) Phagocytosis of bacteria
(b) Allergic reactions
(c) Antibody production
(d) Defense against parasites

22. What is the term for low level of all types of blood cells (red blood cells, white blood cells, and platelets)?

(a) Aplastic anaemia
(b) Leukocytosis
(c) Pancytopenia
(d) Thrombocytosis

23. Which laboratory test measures the percentage of red blood cells in a blood sample?

(a) Platelet count
(b) Hematocrit
(c) Coagulation time
(d) Haemoglobin

24. What is the term/word used for the process of breaking down of blood clot?

(a) Thrombolysis
(b) Hemolysis
(c) Coagulation
(d) Fibrinolysis

25. Which of the following is the most mature stage among the normoblasts?

(a) Pronormoblast
(b) Basophilic Normoblast
(c) Polychromatic Normoblast
(d) Orthochromic Normoblast

26. Which of the following is a blood clot that has traveled from its original site and is blocking a blood vessel in another part of the body?

(a) Embolus
(b) Hematoma
(c) Thrombus
(d) Aneurysm

27. Which blood cell type is involved in the body's immune memory and antibody production?

(a) Neutrophils
(b) Memory B cells
(c) Basophils
(d) Eosinophils

28. Which blood cell carry oxygen and carbon dioxide in the bloodstream?

(a) Plasma cells
(b) Red blood cells
(c) Platelets
(d) White blood cells

29. Which type of anaemia is caused by the deficiency of vitamin B12 or folic acid?

(a) Pernicious anaemia
(b) Iron deficiency anaemia
(c) Aplastic anaemia
(d) Hemolytic anaemia

30. Which condition is characterized by excessive production of red blood cells, leading to thickened blood?

(a) Leukaemia
(b) Hemophilia
(c) Polycythemia vera
(d) Thrombocytopenia

31. Heparin may be used at a concentration of-

(a) 15 ± 2.5 iu per ml of blood
(b) 15 ± 2 iu per ml of blood
(c) 10 ± 2.5 iu per ml of blood
(d) 12 ± 2 iu per ml of blood

32. In ESR estimation, sedimentation takes place in three stages which are-

(a) Formation of rouleaux, packing of rouleaux, sinking of rouleaux
(b) Formation of rouleaux, sinking of rouleaux, packing of rouleaux
(c) Packing of red cells, formation of rouleaux, sedimentation of cells
(d) Packing of rouleaux, sedimentation, rouleaux formation

33. Leukaemias are classified as-

(a) Myeloid leukaemia, Lymphatic leukaemia, Atypical leukaemias.
(b) Lymphatic leukaemia, Megakaryocytic leukaemia, mast cell leukaemias.
(c) Myeloid leukaemia, Aleukaemic leukaemia, Chloroma.
(d) Plasma cells leukaemia, Myeloid leukaemia, Eosinophilic leukaemia.

34. The most common leukaemia in children is-

(a) Acute lymphoblastic leukaemia (ALL)
(b) Acute myeloid leukaemia (AML)
(c) Chronic myelogenous leukaemia (CML)
(d) Chronic lymphocytic leukaemia (CLL)

35. A condition in which patient have a normal leucocyte count or less than normal, but shows WBC in the peripheral blood is called-

(a) Acute leukaemia
(b) Chronic leukaemia
(c) Aleukaemic leukaemia
(d) Subleukaemic leukaemia

36. Coagulation time of blood is prolonged in-

(a) Leukaemia
(b) Pernicious anaemia
(c) Chronic leukaemia
(d) Hemophilia

37. Bleeding time is prolonged in-

(a) Vitamin K deficiency
(b) Christmas factor deficiency
(c) Factor VIII deficiency
(d) Von Willebrand disease

38. Aplastic anaemia is-

(a) Megaloblasts
(b) Hypochromic microcytic
(c) Normocytic normochromic with thrombocytopenia
(d) Hyperchromic macrocytic

39. Macrocytic anaemia is due to the deficiency of-

(a) Vit B12
(b) Vit C
(c) Vit B1
(d) Vit B6

40. Which of the following is not a symptom of Thalassaemia disease?

(a) Abdominal cramps
(b) Dark urine
(c) Slow growth and weakness
(d) Facial bone deformities

41. Which type of Thalassemia disease is Cooley anaemia?

(a) Alloimmunization
(b) Beta-thalassaemia
(c) Alpha-thalassaemia
(d) None of the above

42. The malignant tertian malaria is caused by-

(a) Plasmodium falciparum
(b) Plasmodium ovale
(c) Plasmodium malariae
(d) Plasmodium vivax

43. The most common cause of iron deficiency anaemia in men is-

(a) Vitamin C deficiency
(b) Chronic intravascular hemolysis
(c) Chronic occult bleeding
(d) Vegetarian diet

44. Anisocytosis is the changing in the-

(a) Shape of RBC
(b) Size of RBC
(c) Production of RBC
(d) Haemoglobin content in RBC's

45. In what type of anemia is the count of reticulocyte increased-

(a) Acute post-hemorrhagic anaemia
(b) Vitamin B12 deficiency anaemia
(c) Aplastic anaemia
(d) Fanconis anaemia

46. What kind of anaemia is characterized by decreasing synthesis of heme?

(a) Iron deficiency anaemia
(b) Sickle cell anaemia
(c) Thalassemia
(d) Haemolytic anaemia

47. The vitamin essential for blood clotting is-

(a) Vitamin C
(b) Vitamin B
(c) Vitamin K
(d) Vitamin A

48. The plasma protein involved in coagulation of blood is-

(a) Albumin
(b) Globulin
(c) Fibrinogen
(d) Amylase

49. The following set of findings is seen in DIC:

(a) Increased FDP, prolonged PT, reduced platelets
(b) Increased fibrinogen, increased antithrombin III, increased thrombin-antithrombin III complexes
(c) Increased FDP, decreased PT, increased antithrombin III
(d) Increased FDP, prolonged PT, reduced platelets

50. After releasing O^2 at the tissues, haemoglobin transports-

(a) O^2 to the lungs
(b) Nutrients
(c) CO^2 and protons to the lungs
(d) CO^2 and protons to the tissue

51. Before blood donation, the intended venipuncture site must be cleaned with a scrub solution containing-

(a) Hypochlorite
(b) PVP iodine complex
(c) Isopropyl alcohol
(d) 10% acetone

52. One of the cause for permanent deferral of blood donation is-

(a) Diabetes
(b) Residence in an endemic malaria region
(c) History of therapeutic rabies vaccine
(d) History of jaundice of uncertain cause

53. The western blot is a confirmatory test for the presence of-

(a) Anti-HIV 1,2
(b) Anti-HIV 1
(c) HBsAg
(d) CMV antibody

54. Which of the following is the correct storage temperature for the component listed?

(a) Cryoprecipitated AHF, 4° C
(b) Platelets, 37° C
(c) Red blood cells frozen, -40° C
(d) Fresh frozen plasma, -20° C

55. Which apheresis platelets product should be irradiated?

(a) A directed donation given by a mother for her son.
(b) Autologous unit collected prior to surgery.
(c) Random stock unit going to a patient with DIC.
(d) A directed donation given by an unrelated family friend.

56. During storage, the concentration of 2,3-diphosphoglycerate (2,3-DPG) decreases in a unit of-

(a) Platelets
(b) Fresh frozen plasma
(c) Cryoprecipitated AHF
(d) Red blood cells

57. The most effective component to treat a patient with fibrinogen deficiency is-

(a) Fresh frozen plasma
(b) Cryoprecipitated AHF
(c) Fresh whole blood
(d) Platelets

58. According to the AABB standards, what is the minimum pH required for platelet at the end of the storage period?

(a) 6.0
(b) 6.8
(c) 6.2
(d) 7.0

59. The following are the types of autologous transfusion, except

(a) Pre-operative/Pre-deposit
(b) Acute isovolaemic haemodilution
(c) Single-arm procedure
(d) Intra operative blood salvage

60. The function of adenine in CPDA is-

(a) Supports ATP generation by glycolytic pathways.
(b) Synthesizes ATP, increases level of ATP, extends the shelf life of red cells to 42 days.
(c) Prevents coagulation by chelating calcium.
(d) Prevents fall in pH.

61. Which of the following is a functional unit of a body?

(a) Mitochondria
(b) Cytoplasm
(c) Spleen
(d) Cell

62. Which of the following are phagocytic cells?

(a) Neutrophils, macrophages
(b) Mast cells, antibodies
(c) Mast cells, macrophages
(d) Neutrophils, mast cells

63. Which of the following is known as the powerhouse of a cell?

(a) Cytoplasm
(b) Lysosome
(c) Nuclei
(d) Mitochondria

64. Which of the following is a connective tissue?

(a) Ligament
(b) Blood
(c) Tendon
(d) All of the above

65. Cartilage is not found in-

(a) Kidney
(b) Nose
(c) Ear
(d) Larynx

66. Voluntary muscles are found in-

(a) Limbs
(b) Alimentary canal
(c) Bronchi of lungs
(d) Iris of the eye

67. Nerve cell does not contain-

(a) Dendrites
(b) Axon
(c) Tendons
(d) Nerve endings

68. Which of the following statements about elastic fibers in lungs is the most accurate?

(a) There is plenty of elastic fibers in the lungs
(b) There are elastic fibers in the lung, but in the wall of artery only
(c) There are some elastic fibers in the lung
(d) There are no elastic fibers in the lung

69. Circular folds in the small intestine are based on projections of some layer of the wall called-

(a) Lamina propria
(b) Muscularis externa
(c) Solar plexus
(d) Submucosa

70. In which part of the digestive tube do we have main Peyer's patches?

(a) In the jejunum
(b) In the colon ascendens
(c) In the ileum
(d) In the colon descendens

71. What is the function of Kupfer cells in the liver?

(a) They are stem cells for hepatic epithelial tissue
(b) They are tissue resident macrophages
(c) They are storage site for Vitamin A
(d) They are stem cells for hepatic connective tissue

72. Which cells produce testosterone?

(a) Sertoli cells
(b) Myoidal cells
(c) Sperms
(d) Leydig cells

73. Which stage of development of sperm is diploid?

(a) Secondary spermatocyte
(b) Spermatid
(c) Spermatogonia B
(d) Spermatozoan

74. Surface epithelium of ovary (germinal epithelium) is-

(a) Simple cuboidal epithelium.
(b) Simple squamous epithelium.
(c) Stratified cuboidal epithelium.
(d) Stratified squamous epithelium.

75. Which statement about primary oocytes is not true?

(a) They are surrounded by follicular cells.
(b) They are arrested in meiosis.
(c) They are produced in surface epithelium of ovary.
(d) They are formed before birth.

76. Which of the following structure encloses glomerulus?

(a) Medullary pyramids
(b) Cortex
(c) Bowman's capsule
(d) Renal capsule

77. Which of the following prevents the backflow of urine?

(a) Oblique opening of ureters
(b) Valves
(c) Muscles
(d) Urinary sphincter

78. Capillary hydrostatic pressure during filtration is built in the glomerulus as-

(a) An efferent arteriole is narrow compared to afferent
(b) Bowman's capsule is cup-shaped
(c) An afferent arteriole is narrow compared to efferent
(d) Size of Bowman's capsule is significantly large

79. Which of the following is not included in the aim of fixation?

(a) To prevent putrefaction
(b) Remove excess water from the tissue
(c) Render the tissue suitable for subsequent staining
(d) Prevent osmotic swelling

80. Which statement about Formaldehyde is false?

(a) The best fixative for nucleic acids
(b) It is water soluble gas (sat.approx. 40%)
(c) Penetrates tissue rapidly
(d) Fixes tissue rapidly

81. Formalin solution (10% unbuffered) is composed of-

(a) 50ml formaldehyde (40%) and 50ml distilled water.
(b) 10ml formaldehyde (40%) and 90ml distilled water.
(c) 90ml formaldehyde (10%) and 10ml distilled water.
(d) 95ml formaldehyde (10%) and 15ml distilled water.

82. What should be the thickness of the paraffin embedded sections that has been cut for staining?

(a) 5-8 uM
(b) 5-8 nM
(c) 3-4 mm
(d) 3-4 cm

83. How can you achieve better resolution in microscopy?

(a) Using thinner resin-embedded sections
(b) Using paraffin-embedded sections
(c) Using formaldehyde-embedded sections
(d) Using a mixture of paraffin and resin

84. What color will Haematoxylene stain the nuclei?

(a) Red
(b) Dark blue-purple
(c) Greenish blue
(d) Reddish

85. Which of the following acid may be used for decalcification?

(a) 5% nitric acid
(b) 25% sulfuric acid
(c) 20% hydrochloric acid
(d) 3 % phosphoric acid

86. Tissue processing unit are also known as-

(a) Histomat
(b) Histobath
(c) Histoform
(d) Histokinette

87. Which is the most commonly used fixative in clinical practice?

(a) Bouins fluid
(b) Carnoy's fluid
(c) 10% natural buffered formalin
(d) 20% natural buffered formalin

88. Acid-fast staining is based on the principle of-

(a) Lipid content
(b) Cell wall thickness
(c) Cell shape
(d) Acid resistance

89. PAS stains the following except:

(a) Fungal cell wall
(b) Glycogen
(c) Lipids
(d) Basement membrane of bacteria

90. Which type of chemical interaction is the main principle of basic staining methods?

(a) Van der Waals interaction between charged biomolecules and charged molecules of dyes.
(b) Covalent bonds between charged biomolecules and charged molecules of dyes.
(c) Electrostatic interaction between charged biomolecules and charged molecules of dyes.
(d) It depends on the staining technique, different principles can be dominant.

91. This is the most common specimen used for cytologic cancer screening around the world (mass population screening for cancer)-

(a) Cervical smear
(b) Bladder washing
(c) Prostate massage
(d) Both (a) & (b)

92. The technique used to extract expressed prostatic secretions (EPS) by stroking the prostate several times in order to allow the EPS to reach the urethra-

(a) Retrograde catheterization
(b) Prostatic massage
(c) Bladder Irrigation
(d) None of the above

93. Which of the following are true for Gram-negative bacteria?

(a) Upon alcohol treatment, the permeability of the cell wall increases
(b) Crystal violet-iodine (CV-I) complex is extracted
(c) Pore size decreases and the CV-I complex cannot be extracted
(d) Alcohol treatment increases the permeability of the cell wall and the CV-I complex can be extracted

94. In Mayers Mucicarmine stain the mucin will appear-

(a) Deep rose
(b) Dark blue
(c) Violet
(d) Dark brown

95. The composition of May Grunwald's staining solution is-

(a) 5gm of powder dye in 200ml of methanol
(b) 2gm of powder dye in 100ml of methanol
(c) 0.3gm of powder dye in 100ml of methanol
(d) 2gm of powder dye in 50ml of ethanol

96. Specimens may be obtained during bronchoscopy by-

(a) Aspiration of secretions
(b) Direct smears of suspicious area
(c) Bronchial washing
(d) All of the above

97. The process of cleaning out the contents of the stomach is called-

(a) Gastric suction.
(b) Gastric lavage.
(c) Stomach wash.
(d) All of the above

98. Minimum time required for wet fixation is-

(a) 5 minutes.
(b) 15 minutes.
(c) 30 minutes.
(d) 45 minutes.

99. For dehydration of cytological smear, rectified spirit is not used because-

(a) it affects cytoplasmic staining.
(b) it affects nuclear staining.
(c) it affects both cytoplasmic and nuclear staining.
(d) none of the above

100. The gauge of needle required for the fine needle aspiration is-

(a) 21/27 G
(b) 14/24 G
(c) 11/17 G
(d) 14/18 G

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