THE KENYA POLYTECHNIC UNIVERSITY COLLEGE

SCHOOL OF HEALTH SCIENCES AND TECHNOLOGY

DEPARTMENT OF BIOMEDICAL LABORATORY SCIENCES AND TECHNOLOGY

DIPLOMA IN MEDICAL LABORATORY SCIENCE

FINAL YEAR EXAMINATION

HISTOCYTOPATHOLOGY

TIME: 3 HOURS

INSTRUCTIONS

This paper consists of TWO SECTIONS: A and B.

Answer **ALL** questions in SECTION A and B.

Circle the letters of ALL correct answers in each multiple choices questions

Any wrong answer for multiple choices will be penalized (0.5 marks)

SECTION A (40 Marks)

1. Mention three popular methods used in the fixation of tissues.
    a) Dehydration, clearing, & embedding
    b) Immersion, perfusion, & injection
    c) Vacuum, injection, & waxes
    d) Immersion, dehydration, & vapour
2. A cytological fixative is;
    a) A fixative employed for the fixation of the tissue morphology
    b) The fixative employed for its specific action upon a specific part of the cell structures
    c) A compound fixative employed in the preservation of the cell nuclear cytoplasm
    d) A fixative employed for the general purposes
3. Which of the following stains will demonstrate elastic fibres in tissue sections
    a) Loyez lithium carbonate haematoxylin
    b) Mayers' acid haematoxylin
    c) Crystal violet
    d) Masson trichrome stain
4. The feed mechanisim of a microtome consists of all the following **EXCEPT**
    a) Knife support
    b) Microtome screw
    c) Ratchet wheel
    d) The handle
5. The following is additive incorporated into paraffin wax to improve it;
    a) Ester wax
    b) Paraffin wax
    c) Stearic acid
    d) Celloidin
6. Chatters are due to;
    a) Tissue being too soft
    b) Knife tilt being too great
    c) Soft wax
    d) Excellent wax
7. Chloroform as a clearing agent;
    a) Is cheap
    b) Is flammable
    c) Harden the tissue
    d) Does not make tissue transparent
8. Most mountants have a refractive index of;
    a) 1
    b) 0.45
    c) 4.47
    d) 1.53

9. The microtome in which tissue block remains stationary while the microtome knife moves during the process of sectioning is;
    a) Sliding microtome
    b) Freezing microtome
    c) Base sledge microtome
    d) Rotary microtome
10. The abrasive(s) used by automatic knife sharpeness include;
    a) Mercuric oxide
    b) Xylole
    c) Soapy water
    d) Aluminium oxide
11. Zenkers' fluid forms the following pigment(s)
    a) Formaldehyde
    b) Mercuric chloride
    c) Hydrogen peroxide
    d) Biliverdin
12. Ribosomes are found abundantly in;
    a) Golgi apparatus
    b) Granular endoplasmic reticulum
    c) Ground substance
    d) Centrioles
13. Lipofuscins pigment is also known as;
    a) Quinine
    b) Wear & tear
    c) Cellulose
    d) Brown autrophy
14. The following dehydrating agent is both miscible with water and paraffin
    a) Acetone
    b) Methylated spirit
    c) Isopropyl alcohol
    d) Dioxane
15. Dyes which possess both reactive acidic groups and reactive basic groups are best classified as;
    a) Acidic dyes
    b) Basic dyes
    c) Compound dyes
    d) Amphoteric dyes
16. Cuboidal epithelial cells are found in;
    a) Thyroid
    b) Intestine
    c) Stomach
    d) Liver
17. A major factor causing paraffin sections to loosen from their slides when immersed in silver solution is;
    a) High acidity of silver solution
    b) High alkalinity of silver solution
    c) Insufficient fixation
    d) Over fixation

18. One of the following is the proper series of events in histological tissue processing.
    a) Adhesion, floating, drying, mounting, clearing, dehydration
    b) Floating, adhesion, drying, mounting, clearing, dehydration
    c) Drying, floating, adhesion, dehydration, clearing, mounting
    d) Floating, adhesions, dehydration, clearing, drying, mounting
19. Haematoxylin is ripened by;
    a) Oxidation
    b) Reduction
    c) Adding eosin
    d) Adding haematoxylin
20. In Papanicoloau method of staining smear, eosin-azure (EA) dye is;
    a) Main stain
    b) Differentiation solution
    c) Counter stain
    d) Rinsing solution
21. Bluing is;
    a) Differentiation when using haematoxylin
    b) Making the cytoplasm blue when using haematoxylin
    c) Making the nucleus blue when using haematoxylin stain
    d) Making all parts of cell/tissue blue when using haematoxyl stain
22. To make embedding medium, celloidin is dissolved in;
    a) 1% acid alcohol
    b) Equal volumes of ethyl alcohol &chloroform
    c) Equal volumes of ethyl alcohol & ether
    d) Equal volume of water & ethyl alcohol
23. Which of the following is not natural dye?
    a) Saffron
    b) Picric acid
    c) Hamatoxylin
    d) Orcein
24. Thickness of paraffin wax section is usually;
    a) 3-5millimeter
    b) 3-5micrometer
    c) 3-5centimeter
    d) 3-5inches
25. Perenyi's fluid contains the following **except;**
    a) Formic acid
    b) Ethyl alcohol
    c) Nitric acid
    d) Chromic acid
26. Starch paste;
    a) Is a tissue embedding medium
    b) Is used in PAS technique
    c) Contain gelatine
    d) Is a tissue adhesive
27. The following is true of carmine dye (stain)
    a) Is obtained from female cochineal bug
    b) Is obtained from male cochineal bug
    c) Is a powerful cytoplasmic stain
    d) Is a powerful nuclear stain

28. Tissues must be washed in running tap water for several hours after fixation with;
    a) Flemmings fluid
    b) 10% formalin
    c) Carnoys fluid
    d) Glutaldehyde
29. When mounting museum specimen some clearance is left on the edge and from base so as to;
    a) Easily turn the tissue
    b) Avoid breaking the containers
    c) Provide space for the label
    d) Allow easy penetration of a mounting fluid
30. Why is it advisable to prepare brain tissue in a container different from bone specimen?
    a) Brain can easily damage bone tissues
    b) Chemicals used for the two are different
    c) Method of fixation is different
    d) Bone tissues can be easily damage brain tissue
31. During embedding, dye is put in embalming fluid to;
    a) Stain the tissue of remains
    b) Increase viscosity of containing fluid
    c) Enable monitoring of flow of embalming fluid
    d) Preserve embalming fluid
32. Tissue are dehydrated to remove;
    a) Water to enable filtration
    b) Water to enable staining
    c) Water to increase refractive index
    d) To remove water to fix the tissue
33. Tissues for autoradiography are best fixed in;
    a) Formal sublimate
    b) Absolute ethanol
    c) 10% formalin
    d) Carnoys fluid
34. Prolonged exposure to the acidic vapour produced by osmium tetroxide may result in;
    a) Sinusitis
    b) Dermatitis
    c) Calcification of tissue
    d) Blindness
35. Peterfi's double embedding method is necessary for the following tissues;
    a) Lung
    b) Liver
    c) Eye
    d) Muscle
36. Low viscosity nitrocellulose embedded tissues are stored in;
    a) Water
    b) Dry atmosphere
    c) 10% formalin
    d) 70% alcohol

37. Tissues and cells dissociation method are examined by ;
    a) Electron microscopy
    b) Dark ground microscopy
    c) Phase contrast microscopy
    d) Bright illumination
38. Which of the following microtomes will produce ribbons and serial sections from paraffin embedded tissues;
    a) Freezing
    b) Cryostat
    c) Rotary
    d) Base sledge
39. Tissue processing include one of the following steps;
    a) Trimming
    b) Washing with running tap water for 24hrs
    c) Treatment with alcoholic picric acid
    d) Impregnation & dehydration
40. Freezing microtome is suitable for;
    a) Paraffin wax embedded tissue
    b) Celloidin embedded tissue
    c) Need a temperature of 2 - 4^{o} c
    d) Demonstration of fat in tissue

Section B: (60 marks)

41(a) (i) Explain the purpose of staining a tissue section (3 Marks)
(ii) List five haematoxylin staining solution in a histology laboratory (5 Marks)
(iii) Which one of them is used for staining cell organelle study? (2 Marks)
(b) Explain the mode of preparation for one of them and name ALL the ingredients (10 Marks)

41. (a) (i) Define exfoliative cytology (3 Marks)
(ii) State the diagnostic significance of cytology (3 Marks)
(iii) Name four cytological smear fixatives used in a cytology laboratory. (4 Marks)

(b) Describe the collection and preparation of sputum specimen for studies

42. (a) Describe how the ileum is fixed (7 Marks)
(b) Give **three** reasons for preparing museum mounts (3 Marks)
(c) Outline the Kaiserling technique for preparing museum mounts for gross specimen display. (10 Marks)