



(University of Choice)

**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

UNIVERSITY EXAMINATIONS (MAIN PAPER)

2023/2024 ACADEMIC YEAR

THIRD YEAR FIRST SEMESTER EXAMINATIONS

FOR THE DEGREE

OF

BACHELOR OF SCIENCE IN MEDICAL LABORATORY SCIENCES

COURSE CODE: BML 313

**COURSE TITLE: MEDICAL HISTOPATHOLOGY AND
CYTOPATHOLOGY**

DATE: 7TH DECEMBER 2023

TIME: 2.00-4.00PM

INSTRUCTIONS TO CANDIDATES

This paper is divided into three sections, A B and C, carrying respectively: Multiple Choice Questions (MCQs), Short Answer Questions (SAQs) and Long Answer Questions (LAQs). Answer all questions. **DO NOT WRITE ON THE QUESTION PAPER**

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 4 Printed Pages. Please Turn Over

SECTION A: Multiple Choice questions (20marks)

1. Partially obscuring blood, inflammation, thick areas, poor fixation, air-drying artifact, contaminant, etc. are reported as unsatisfactory factors for evaluation of a pap smear if they preclude: interpretation of approximately what percentage of the smear?
 - A. 50% -75%
 - B. 30%-50%
 - C. 10%-40%
 - D. 20%
2. Smear preparation technique that produces a smear whose cells orientation on the slide is exactly as it appeared in the body tissue is called
 - A. Touch imprint
 - B. Lift technique
 - C. Pull-apart smear
 - D. Monolayer smear
3. The method of staining used in microscopy to examine microorganisms and special entities not seen by a routine stain in cytosmears and tissue preparations is known as:
 - A. Special staining.
 - B. Supravital staining
 - C. Routine staining.
 - D. Immunohistochemical staining
4. 10% Carnoy's wet fixative is used in cytology for lysing red cells while 10% formal saline is used in which of the following cyto-preparatory technique?
 - A. Fixing cells in life-like manner as possible
 - B. Lysing erythrocytes to reduce obscuring elements
 - C. Routine fixation
 - D. Cell block technology
5. The cytopathological technique in visualization and recognition of antigen in cells in a smear preparation with the help of corresponding antibody is abbreviated as:
 - A. C.C.C
 - B. I.H.C
 - C. I.C.C
 - D. G.I.S.T
6. Each Human Papilloma Virus has its own oncogenic type which is designated by a number. Which of the following set contains exclusively high-risk HPV types?
 - A. 6,11,16,18,82
 - B. 11,42, 54,31,70
 - C. 16,32,33,35,18
 - D. 16,42,43,44,73
7. The cells are commonly seen in pap smears postmenopausal women are called:
 - A. Parabasal
 - B. Endometrial
 - C. Superficial
 - D. Intermediate
8. Monolayer smear is prepared with the aid of which of the following equipment?
 - A. Fluid transfer Tissue processor
 - B. Cytospin centrifuge
 - C. Tissue-transfer tissue processor
 - D. Cytobrush (broomlike device)

9. Acute angle branching of hyphae is characteristic of which of the following microorganisms?
 - A. *Candida glabrata*
 - B. *Gadnerella vaginalis*
 - C. *Aspergillus spp*
 - D. *Actinomyces*
10. The Papanicolaou stain is preferred for cyto-smear staining because of the following reason:
 - A. It imparts cytoplasmic transparency and demonstrates intracytoplasmic keratin
 - B. It stains young cells pink and mature cells in shades of blue-green
 - C. It gives obscure nuclear detail
 - D. It produces non-differential staining
11. Progressive H&E staining protocol differs from regressive Papanicolaou staining protocol in that
 - A. The bluing step is skipped in the former
 - B. The former uses two counterstains
 - C. The later uses one counterstain
 - D. The differentiation step is skipped in later
12. Amyloid deposits in medullary carcinoma of the thyroid gland will test positive by which of following special stains?
 - A. Periodic acid Schiff
 - B. Grocott's Methenamine silver
 - C. Congo red
 - D. Perl's Prussian blue reaction
13. Low grade squamous intraepithelial lesion of the cervical mucosa is caused by which of the following HPV oncogenic types?
 - A. Low risk HPV type only
 - B. High Risk HPV types only
 - C. Both low risk and high risk
 - D. Types 42,43,44,70
14. The biological potential, the health status of a cell is determined microscopically, by carefully evaluating the:
 - A. Mitotic figures
 - B. Mitochondria
 - C. Cytoplasm
 - D. Nucleus
15. Sentinel, naked bipolar nuclei in a breast FNA biopsy are a characteristic of:
 - A. Ductal cells,
 - B. Myoepithelial cells
 - C. Foam cells
 - D. Apocrine cells
16. A pap smear is considered satisfactory for evaluation if the transformation zone has been sampled and there is the presence of:
 - A. 8000-12000 Endocervical cells in liquid-based cytology preparations
 - B. At least 5000 squamous metaplastic cells in conventional preparations
 - C. 2000 endometrial cell in reproductive women
 - D. Superficial and Intermediate cells
17. Abundant colloid and few cells observed in thyroid FNAB, correlate with
 - A. Follicular neoplasm
 - B. Microfollicles
 - C. Colloid nodule
 - D. Adenomatous/cellular nodule

18. A procedure whereby several core biopsies are obtained from a tumor site in order to do an extensive selection of cells for testing is called
 - A. Colposcopic biopsy
 - B. Saturation biopsy
 - C. Curettage
 - D. Loop electro surgical excision of the transformation zone
19. Why are Cell Blocks preparations becoming increasingly popular in diagnostic cytopathology?
 - A. Cells enmeshed in the clot formed help to decrease positivity percentage
 - B. They reveal certain histologic aspects not visible in smears
 - C. They do not allow recovery and processing minute amounts of FNA samples
 - D. The method is complex to perform
20. Which of the following statements is not true regarding recognizing the precise criteria for malignancy microscopically?
 - A. The nuclear membrane becomes irregular and nuclei become disorderly
 - B. The secretory properties of the cell are intensified e.g hyperchromasia and orangiophilia
 - C. The presence of atypical mitotic figures and abnormal irregular chromatin
 - D. The cell size generally reduces, nucleoli inconspicuous and cell borders resemble honeycomb

SECTION B: Short Answer Questions (40 Marks)

1. a). Outline the three major components of a biopsy report and two types of histology reports. **(5 marks)**
 b). Citing an example, explain how each the following surgical pathology specimen is harvested: *Core biopsy, Large Loop Excision of the Transformation Zone biopsy, Fine Needle Aspiration biopsy, Punch biopsy, and Incision biopsy* **(5 marks)**
2. Using a graphic representation, explain the role of colloid in the diagnosis and classification of thyroid neoplasms **(5marks)**.
3. a). Encapsulate the five-step embalming process **(5marks)**
 b). Describe the five methods of exfoliative cytopathology specimen collection **(5 marks)**
4. Describe five types of autopsies that are performed in the mortuary **(5 marks)**
5. Explain how histopathological tissue sections are prepared prior to being subjected to a molecular diagnostic procedure such as fluorescent *in situ* hybridization. **(5marks)**
6. Outline the salient features of the interpretation category of the Bethesda System for Reporting Cervical cytology **(5marks)**

SECTION C: Long Answer Questions (60 Marks)

1. Explicate the Triple Test score for evaluation of breast masses and describe characteristic features of benign and malignant breast cells. **(20 marks)**.
2. Chronicle the step-by-step process of how to prepare a waxed serial section for subsequent microscopic demonstration of the fine lanceolate structures of *Streptococcus pneumoniae* from a bronchioalveolar lavage sample **(20marks)**
3. From sample collection to staining, account, in sequential order, for twenty mistakes (and remedial actions) done to a tissue sample, by patient, surgeon and histopathologist, that may compromise production of quality, stained histological preparations. **(20 marks)**