



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

**MAIN CAMPUS**

**UNIVERSITY EXAMINATIONS  
2019/2020 ACADEMIC YEAR**

**THIRD YEAR SECOND TRIMESTER EXAMINATIONS**

**FOR THE DEGREE  
OF  
BACHELOR OF SCIENCE MEDICAL LABORATORY SCIENCES  
MAIN EXAM**

**COURSE CODE: BML 215**

**COURSE TITLE: HISTOLOGY AND CYTOLOGY**

**DATE:**

**TIME: 2 HOURS**

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**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**).

All questions are compulsory

MMUST observes ZERO tolerance to examination cheating

## SECTION A MULTIPLE CHOICE QUESTIONS 20 MARKS

1. In decalcification, formation of a precipitate after addition of ammonium oxalate indicates;

- A) Traces of calcium
- B) Substantial amounts of calcium
- C) Absence of calcium
- D) Decalcifying fluid is basic

2. Blood is considered a connective tissue because

- A) It connects parts of the body together
- B) It provides support
- C) Arises from mesenchymal tissue and has a non-living fluid matrix
- D) It contains fibroblasts

3. Iron hematoxylin:

- A) Enhances the combination of the dye with the nucleus
- B) Colors the nucleus black
- C) Used for progressive staining
- D) Used for regressive staining

4. Refers to the fact that an epithelium tissue has only one layer of cells

- A) Stratified
- B) Cuboidal
- C) Simple
- D) Pseudostratified

5. Which chemical is the most commonly used as a fixative for pathological specimens?

- A) Picric acid
- B) Mercuric chloride
- C) Ethanol
- D) Formaldehyde

6. Which of the following tissue types controls body functions?

- A) Blood
- B) Nervous tissue
- C) Muscular tissue
- D) Epithelial

7. Compound tissues is defined as

- A) Different types of cells performing one function
- B) Different types of cells which are different in structure and function
- C) Similar cells at different regions performing many functions
- D) Similar type of cells held together by connective tissue

8. Epithelium of the bronchi is

- A) Cuboidal
- B) Simple cuboidal

- C) Simple squamous
- D) Pseudo stratified ciliated columnar.

9. The element of a synapse which contains neurotransmitter prior to release is called the:

- A) Synaptic cleft
- B) presynaptic membrane
- C) postsynaptic membrane
- D) synaptic vesicle

10. A site of communication between neurons is called a:

- A) axon
- B) dendrite
- C) synapse
- D) cell body

11. The gap between two adjacent myelin segments along an axon is called the:

- A) axolemma
- B) internode
- C) axonal cleft
- D) Node of Ranvier

12. The process observed when intracytoplasmic enzymes are responsible for tissue degradation

- A) Anoxia
- B) Putrefaction
- C) Osmotic injury
- D) Autolysis

13. The portion of a nerve cell which contains the nucleus and most of the metabolic machinery is called the:

- A) Axon
- B) dendrite
- C) synapse
- D) cell body

14. This process facilitates easy handling and storage

- A) Deparaffinization
- B) Hydration
- C) Dehydration
- D) Mounting

15. Skeletal muscle fibers are best described as:

- A) multinucleate "cellular" units.
- B) subcellular bundles of contractile filaments.
- C) motor axons.
- D) long protein molecules.

16. How is a pseudostratified epithelium different from a truly stratified tissue?
- A) The nuclei are at the same level in pseudostratified epithelia.
  - B) The apical and basal surfaces are aligned.
  - C) There are multiple cell layers in pseudostratified epithelia.
  - D) All the cells in a pseudostratified epithelium interact with the basement membrane.
17. All of the following are natural dyes EXCEPT:
- A) Saffron
  - B) Hematoxylin
  - C) Brazilin
  - D) Carmine
18. During the preparation of a routine H&E slide, what step occurs after the tissue is preserved?
- A) Fixation
  - B) Embedding in paraffin
  - C) Slicing
  - D) Dehydration
19. The following factors are characteristic of fixatives EXCEPT
- A) Arrests autolysis
  - B) Activates bacterial decomposition
  - C) Minimizes loss of soluble cellular components
  - D) Stabilizes tissue for further processing
20. Functional division of the nervous system responsible for the physiological changes seen during exercise
- A) Somatic
  - B) Autonomic
  - C) Enteric
  - D) Central

**SECTION B: SHORT ANSWER QUESTIONS (40 MARKS)**

1. What are the qualities of a good histological fixative? [5mks]
2. Enumerate the functions of connective tissues [5mks]
3. Describe the chemical method of determining the end point of decalcification [5mks]
4. Describe the process “bringing sections to water”. [5mks]
5. a) Outline the types of hematoxylin dyes [2mks]
- b) Highlight the differences between the two types of hematoxylin [8mks]

- 6 a) List the different tissues cells making up the human body [4mks]  
b) Classify neurons based on their functions [6mks]

**SECTION C: LONG ANSWER QUESTIONS**

1. Describe the cell block technique for cytological samples indicating its advantages and disadvantages as opposed to conventional smear technique [20mks]
  2. Discuss in detail the protocol of tissue processing utilizing molten paraffin wax. [20mks]
  3. Classify and describe the various epithelial tissues [20mks]
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