

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**THIRD YEAR EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF
SCIENCE IN BIOMEDICAL SCIENCE AND TECHNOLOGY**

BMET 213: MEDICAL HISTOLOGY

STREAMS: BSC BIOMED Y2S1

TIME: 2 HOURS

DAY/DATE: MONDAY 22/03/2021

2.30 P.M. – 4.30 P.M.

INSTRUCTIONS:

**Answer question ONE and any other TWO questions.
Do not write on the question paper.**

QUESTION ONE (30 MARKS)

- (a) Briefly describe fluorescence in situ hybridization (FISH) as an important laboratory technique in medical histology. (7 marks)
- (b) Briefly describe the term histology. (2 marks)
- (c) Explain the following terms as used in medical histology:
 - (i) Counterstain (2 marks)
 - (ii) Basophilic (2 marks)
 - (iii) Acidophilic (2 marks)
 - (iv) Biopsy (1 mark)
 - (v) Birefringence (2 marks)
- (d) Highlight any two light microscopic features of the plasma membrane. (1 mark)
- (e) Give examples of tissue components, large molecules, lost during routine fixation in aqueous fixatives. (3 marks)
- (f) Briefly describe the importance of monoclonal antibodies in medicine. (3 marks)

- (g) Describe the steps followed during specimen preparation, to improve contrast and resolution in the transmission electron microscope (TEM). (3 marks)
- (h) Describe the importance of virtual microscopy as an alternative to the examination of glass slides using a light microscope in medical histology. (2 marks)

QUESTION TWO (20 MARKS)

- (a) Discuss the following important light microscopy stain (staining procedures) used in medical histology.
 - (i) Mallory Trichrome (4 marks)
 - (ii) Periodic Acidic-Schiff Reaction (PAS) (3 marks)
 - (iii) Stains for Lipid (3 marks)
- (b) Using a well-labelled diagram, explain the principles of confocal microscopy. (10 marks)

QUESTION THREE (20 MARKS)

- (a)
 - (i) Distinguish between direct and indirect immunofluorescence methods. (10 marks)
 - (ii) Explain the advantages and drawbacks of the above techniques. (4 marks)
- (b) Describe the importance of enzyme digestion as used in medical histology. (6 marks)

QUESTION FOUR (20 MARKS)

- (a) The most common procedure used in histologic research is the preparation of tissue slices or “sections” that can be examined visually with transmitted light. Discuss, in detail the process of the preparation of tissues for histologic study. (15 marks)
 - (b) Briefly describe the term “metachromasia” and its underlying mechanism. (5 marks)
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