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KIBABII UNIVERSITY

**UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR**

**SECOND YEAR SECOND SEMESTER MAIN EXAMINATIONS
FOR THE DEGREE OF BACHELOR OF EDUCATION SCIENCE**

COURSE CODE: ESM 221

COURSE TITLE: BIOLOGICAL TECHNIQUES

DATE: WEDNESDAY 1st August 2018 **TIME:** 2:00 – 4:00 p.m.

INSTRUCTIONS TO CANDIDATES

Answer Question one (1) and any other two (2) Questions. Question one is compulsory and carries 30 marks, the other Questions carry 20 marks each.

TIME: 2 Hours

KIBU observes ZERO tolerance to examination cheating

This Paper Consists of 2 Printed Pages. Please Turn Over. ►

QUESTION ONE (30MKS)

- i. Outline the differences between a compound light microscope and an electron microscope. (5 marks)
- ii. Briefly explain **FIVE** reasons why tissue fixation may be unsuccessful. (5 Marks)
- iii. a) What is Microtome. (1 Marks)
b) State **FOUR** types of microtome knives. (4 Marks)
- iv Highlight plant collection requirements in herbarium preparation. (5 Marks)
- v. a) What is a biological hazard. (2 Marks)
b) Outline **SIX** sources of biological hazards. (3 Marks)
- vi. Describe how you would prepare 70% v/v Ethanol of volume 250mls (5 Marks)

QUESTION TWO

- a) You have been provided with a bacterial cell culture, describe how you can use gram stain technique to differentiate two major groups of bacterial cells. (16 marks)
- b) Distinguish between differential and simple stains. (4 Marks)

QUESTION THREE

- a) Describe in details, sectioning devices and its importance. (16 Marks)
- b) State **FOUR** methods of preserving animal tissues. (4 Marks)

QUESTION FOUR

- a) Discuss the various types of tissue fixation techniques (15 marks)
- b) With examples, highlight the 4 classes of fixatives (5 marks)

QUESTION FIVE

Discuss the application of various biological techniques in medical diagnosis and biological research (20 marks)