



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MEDICAL ENGINEERING

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN MEDICAL ENGINEERING

ECL2202: CLINICAL SAFETY

END OF SEMESTER EXAMINATION

SERIES:AUGUST2019

TIME:2HOURS

DATE:1Aug2019

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

Question ONE

- (a) Distinguish between class and type of medical electrical equipment highlighting the categories in each (8 marks)
- (b) Describe FOUR factors that influence the body reaction to current flow through it (8 marks)
- (c) Describe the three most effective methods of radiation protection (9 marks)
- (d) Define the following terms as applied to electrical safety (5 marks)
 - i) Patient Leakage Current
 - ii) Functional Earth Terminal
 - iii) Applied Part
 - iv) Patient Auxiliary Current
 - v) Single fault condition

Question TWO

- (a) Describe using a diagram, the measurement of enclosure leakage current (10 marks)
- (b) State any FOUR methods of minimizing the risk of electric shock in medical equipment (10 marks)

Question THREE

- (a) Explain the start-up procedures when preparing for work in the Biological Safety Cabinet (16 marks)
(b) Outline FOUR types of Late effects of radiation (4 marks)

Question FOUR

- (a) It is a basic biosafety principle that all contaminated materials be decontaminated prior to disposal. State any FIVE methods of decontamination. (5 marks)
(b) Outline any FOUR advantages of incineration (4 marks)
(c) List any THREE observations that prevent the spread of biological hazard in the hospital. (3 marks)
(d) Describe TWO general requirements for packaging clinical waste (6 marks)
(e) Explain the need for biological safety cabinets (2 marks)

Question FIVE

- (a) i) With the aid of a diagram explain the relationship between the level of perception and the let-go currents as a function of frequency.
ii) Using the diagram in (i) above explain why electrosurgical systems can be used on a patient without causing ventricular fibrillation. (12 marks)
(b) Explain FOUR design features of a piece of equipment that ensure electrical safety within hospital (8 marks)