



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) Explain the effects of ionising radiation at the cellular level (4 marks)
- (b) Illustrate how leakage currents can be hazardous to the electrically sensitive patient (8 marks)
- (c) Explain **FIVE** common problems in incinerators (10 marks)
- (d) Outline any **FOUR** design recommendations that ensures electrical safety within the hospital. (8 marks)

Question TWO

- (a) State **FOUR** factors that influence how the body reacts to current flow through it. (4 marks)
- (b) With the aid of a diagram, describe the measurement of enclosure leakage current. State the allowable values. (10 marks)
- (c) Explain the principle behind the philosophy of electrical safety test (6 marks)

Question THREE

- (a) Explain how X-rays and γ -rays differ from particle radiations (4 marks)
- (b) Describe the **FOUR** natural sources of ionising radiation. (12 marks)
- (c) Outline **FOUR** methods of radiation safety of hospital workers and the public (4 marks)

Question FOUR

- (a) With reference to medical electrical equipment, define the following terms
- i) Applied part
 - ii) Enclosure leakage current
 - iii) Accessible metal part (6 marks)
- (b) Distinguish between a type BF and type CF Medical electrical equipment (4 marks)
- (c) i) Explain TWO functions of line isolation monitors in hospitals
- ii) With the aid of a diagram, explain the operation of a ground fault interrupter (10 marks)

Question FIVE

- (a) i) Explain THREE reasons for incineration in hospitals
- ii) Describe the multiple chamber incinerator (9 marks)
- (b) With the aid of a diagram, explain the major components of an incineration system (11 marks)