TECHNICAL UNIVERISTY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF MEDICAL ENGINEERING

DIPLOMA IN MEDICAL ENGINEERING (DME 14M)

ECL 2202: CLINICAL SAFETY

SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: FEBRUARY 2015
TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions. Attempt question **ONE (Compulsory)** and any other **TWO** questions
Maximum marks for each part of a question are as shown

This paper consists of **TWO** printed pages

Question One (Compulsory)

a) (i) Outline FOUR types of late effects of radiation.

(ii) Describe the various methods of protection against ionizing radiation in X-ray imaging applications **(14 marks)**

b) Define the following terms as applied to biological waste:
(i) Biohazard waste
(ii) Infectious waste **(2 marks)**

c) (i) State any FOUR methods of minimizing the risk of electric shock in medical equipment.

(ii) With the aid of a labeled diagram, explain how a core-balanced earth leakage circuit breakers operates **(14 marks)**

Question Two

a) Explain how x-rays and y-rays differ from particle radiations **(4 marks)**

b) Describe FOUR natural sources of ionizing radiations **(12 marks)**

c) Outline FOUR methods of radiation safety of hospital workers and the public **(4 marks)**

Question Three

a) With reference to medical electrical equipment, define the following terms:
(i) Applied past
(ii) Enclosure leakage current
(iii) Accessible metal past

b) Distinguish between a type BF and type CF medical electrical equipment. **(4 marks)**

c) (i) Explain TWO functions of line isolation moultors in hospital

(ii) With the aid of a labeled diagram, explain the operation of a group fault interruption **(10 marks)**

Question Four

a) (i) Explain THREE reasons for incineration in hospitals
(ii) Describe multiple chamber incinerator **(9 marks)**

b) With the aid of a labeled diagram, explain the major components of an incineration system **(11 marks)**

Question Five

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)**