# TECHNICAL UNIVERSITY OF MOMBASA

*Faculty of Engineering and Technology*

DEPARTMENT OF MEDICAL ENGINEERING

BACHELOR OF SCIENCE IN MEDICAL ENGINEERING

BSMD/MAY 2015/S-PT

EBL 4402
MEDICAL IMAGING I

2 hrs

**INSTRUCTIONS TO CANDIDATES:**

- This paper consists of **FIVE** questions
- Answer question **ONE COMPULSORY** and Attempt any Other **TWO**
- This paper consists of 3 printed pages

**Question1**

(COMPULSARY)

(a) i) Explain the functions of the THREE major sections of fluoroscopic equipment

ii) Explain any THREE reasons for using tungsten in the construction of X-ray tube.

(12 marks)

(b) With the aid of a labelled circuit diagram, explain the principle of operation of a capacitor discharge (CD) generator

(12 marks)

(c) Describe the function of the following components used in fluoroscopy system:

i) Last image hold (LIH)

ii) Edge enhancement

(6 marks)

**Question2**

(a) Explain the processing cycle of an automatic X-ray film processor

(8 marks)

(b) With the aid of diagram of a rotating anode X-ray tube, explain the production of X-ray

(12 marks)

**Question3**

(a) Outline the construction features which greatly varies the method of moving the grid

(6 marks)

(b) i) Draw a circuit diagram of an X-ray Machine.

ii) Describe the operation of the diagram in b(i)

(14 marks)

**Question4**

(a) i) Differentiate between vignetting and blooming as used in image intensifier tubes

ii) Outline any Four advantages of a dedicated unit over a simple tomographic attachment.

(12 marks)

(b) Describe the construction features of a dedicated mammography equipment

(8 marks)

**Question5**

(a) i) Draw a labelled diagram of a pen dosimeter

ii) Outline any ***TWO*** properties of Dosimeter.

(8 marks)

(b) i) Distinguish between the terms exposure and absorbed dose as used in X-ray

ii) Describe how the following factor affects the quality and quantity of X-rays applied on a patient:

I) mAs

II) KVp

(12 marks)