Name :	
Roll No. :	A space of Asserting and Excelore
Invigilator's Signature :	

CS/B.TECH(BME)/SEM-5/BME-504/2011-12

2011

MEDICAL IMAGING - I

Time Allotted : 3 Hours

Full Marks: 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words

as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

- 1. Choose the correct alternatives for the following : $10 \times 1 = 10$
 - The Collimator in an X-ray system is located i)
 - before the X-ray tube a)
 - after the X-ray tube b)
 - after the Grid c)
 - d) after the X-ray film.
 - **REM** indicates ii)

a)

c)

- a) maximum permissible dose
- absorbed dose b)
- c) dose equivalent
- relative biological damage. d)
- Low KV technique is used for iii) Bronchography
- Cholisyestography
- Mammography d) Bone studies.

b)

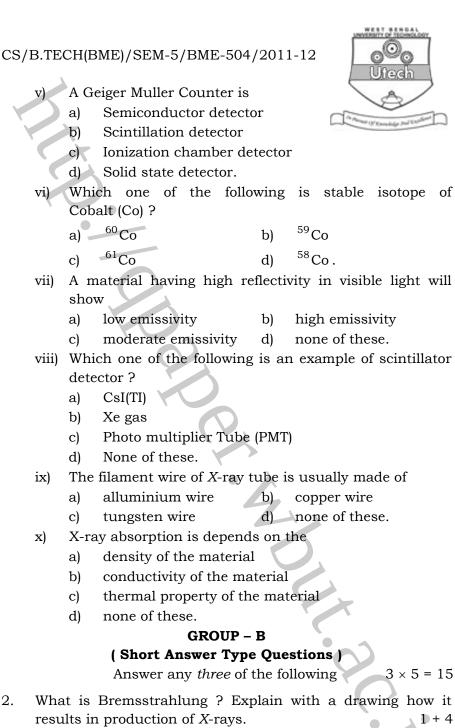
The propagation speed of diagnostic *X*-ray is iv)

> 3×10^6 mtrs/sec a)

- b) 6×10^4 mtrs/sec
- 4×10^3 mtrs/sec 3×10^8 mtrs/sec. c) d)

5418

[Turn over



Describe two methods for automatic exposure timer release. 3.

5418

2.

CS/B.TECH(BME)/SEM-5/BME-50492611-12

- What is the difference between diagnostic and therapeutic radiography ? How does *X*-ray tube current, voltage and duration of exposure differ ? 2 + 3
- 5. Explain the function of Collimators and Grid in diagnostic radiography.
- 6. What are the detectors commonly used in digital *X*-ray radiography ? Briefly describe the working principle of scintillator detector coupled with Photo Multiplier Tube.
- What is digital radiography ? Briefly describe the working principle of an image intensifier tube.
 1 + 4

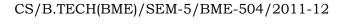
GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

- 8. a) Briefly describe the circuitry of electrical power supply of an *X*-ray machine. 9
 - b) What are the limitations of single phase power supply in *X*-ray radiographic unit ? How is it overcome ? 2 + 4
- 9. a) What is the basic principle of thermographic imaging ?
 - b) What are the detectors used in thermographic imaging ? 3
 - c) Briefly describe a thermographic imaging technique or equipment. 7
 - d) What are the advantages of thermographic imaging over radiographic imaging ? 2
- 10. a) What is a 'Mask' referred to in DSA ? Explain in detail the principle of DSA. 8
 - b) Name and explain a programme by which the route of the catheter is pre-determined in a DSA system. 4
 - c) Mention three advantages of a DSA to the Medical Doctor (end user). 3
- 11. a) What are the limitations of X-ray machine in radiation therapy ? 2
 - b) Why is cobalt (Co) put to medical use and how is it obtained and used in therapy?

3



- Briefly describe the cobalt (Co) radiation therapy c) with proper diagram.
- What are the basic differences between Medical Linear d) Accelerator and cobalt (Co) radiation unit ? 3
- 12. a) What is angiography ? How is it done ? 4
 - Draw a diagram of a digital C-arm fluoroscopy system b) 7 and label the parts.
 - In which area of the hospital is it used ? Name two c) medical procedures for which it has to be necessarily used. 4

13. Write short notes on any *three* of the following : 3×5

- Brachytherapy a)
- Liquid crystal thermography b)
- X-ray high KV technique and application c)
- d) Cineradiography
- Digital C-arm radiographic system. e)