

Con. 3490-11.

(REVISED COURSE)

RK-2664

(3 Hours)

[Total Marks : 100

- NB : (1) Question No. 1 is compulsory.
 (2) Attempt any four questions out of remaining six questions.
 (3) Assume suitable data
 (4) Assumption should be clearly stated
 (5) Use legible handwriting. Use blue/ black ink

1. State with reason whether following statements true or false : 20
 - a) Heal effect becomes prominent when focal spot - film distance increases
 - b) Higher the atomic number of target material greater the efficiency of X-Ray generation.
 - c) Increasing the diameter of ultrasound transducer increases the lateral resolution
 - d) Wavelength of ultrasound changes when it travels from one medium to Another
 - e) X-ray tube of Mammography uses molybdenum as target material.

2. a) List the various interactions of X-Ray with matter and explain the any two interactions which are important to diagnostic imaging. 10
 b) A narrow beam containing 2000 mono energetic photons are reduced to 900 photons by a slab of copper 10^{-2} m thick. What is the total linear attenuation coefficient of the copper slab for these photons? 10
 Define half value layer and calculate the half value layer for copper using above data.

3. a) With different types of detection scheme explain the Digital Radiography system. What are its advantages over film based radiography system? 10
 b) Which are the grid performance evolution parameters? Explain them in detail. 10

4. a) Explain temporal filtering technique of DSA. 10
 b) Explain the construction and working of Image Intensifier tube. 10

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5. a) Define and explain Doppler Effect. 10
Calculate the Doppler shift if Blood is flowing at 20 cm/sec, operating Frequency of transducer is 5 MHz and the angle that the sound beam makes With vessel lumen is 60°
- b) With suitable diagram describe electronic array scanning system 10
6. a) Explain the construction and working principle of endoscopy instrument 10
- b) what are application of thermography in medical field 10
7. Write short notes on:(Any two) 20
- a) Applications of endoscopy
 - b) Medium frequency Generator
 - c) Fresnel zone and fraunhoffer zone.
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