



## BRAINWARE UNIVERSITY

Term End Examination 2023-2024

Programme – B.Sc.(MRIT)-2022

Course Name – Radiation Safety & Hazards

Course Code - BMRITC305

( Semester III )

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

### Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) Can you identify the exposure factor that primarily influences the contrast in an X-ray image?
  - a) Tube voltage (kV)
  - b) Tube current (mA)
  - c) Exposure time (seconds)
  - d) Grid ratio
- (ii) Radiologic technologists often choose exposure factors based on the patient's:
  - a) Age
  - b) Blood pressure
  - c) Weight
  - d) Medical history
- (iii) Name of the exposure factors which is responsible for controlling the energy of the X-ray beam during an exposure
  - a) Tube voltage (kV)
  - b) Tube current (mA)
  - c) Exposure time (seconds)
  - d) Grid frequency
- (iv) Mutations might lead to which of the following?
  - a) Cancer
  - b) Tumor
  - c) Hereditary effect
  - d) All of these
- (v) Identify the backbone of DNA
  - a) Sugar
  - b) Phosphate
  - c) ATGC
  - d) Both 1 & 2
- (vi) According to ICRP which of the following situation may be occur while a person exposed with radiation
  - a) Planned exposure
  - b) Emergency Exposure
  - c) Existing exposure
  - d) All of these
- (vii) Which of the following factor influenced the scatter radiation ?
  - a) Volume of the object to be irradiated
  - b) Spectrum of beam
  - c) Angle of incident of radiation
  - d) All of these
- (viii) Tell the number of parts of a scintillation detector
  - a) 4 parts
  - b) 3 parts

- c) 2 parts  
d) 5 parts
- (ix) Name the detector in which NaI is used as a main component  
a) Gas field detector  
b) Scintillation detector  
c) Pocket dosimeter  
d) None
- (x) Identify the type GM counter  
a) survey meter  
b) pocket dosimeter  
c) Exposing device  
d) All
- (xi) The process of adjusting exposure factors to achieve the best possible image quality while minimizing patient radiation dose is name as  
a) Collimation  
b) Tomography  
c) Optimization  
d) Scintillation
- (xii) Tell the correct reason of using a grid in radiography?  
a) To improve patient positioning  
b) To reduce scattered radiation reaching the image receptor.  
c) To enhance the contrast in the image  
d) To increase the X-ray beam collimation
- (xiii) Identify: Which of the following personnel is responsible for monitoring radiation safety and ensuring compliance with regulations in a radiology department?  
a) Radiologic Technologist  
b) Radiology Nurse  
c) Radiology Administrator  
d) Radiation Safety Officer
- (xiv) Identify the recommended minimum source-to-skin distance (SSD) for mobile radiography?  
a) 50 cm  
b) 100 cm  
c) 150 cm  
d) 200 cm
- (xv) Distinguish between inherent and added filtration. Inherent filtration refers to the filtration present in the X-ray tube and housing, while added filtration is the additional filtration added by the operator. True or False?  
a) True  
b) False

### Group-B

(Short Answer Type Questions)

3 x 5=15

2. What do you mean by radioactivity? Explain. (3)
3. Distinguish between acute and late effect of radiation. (3)
4. Define the primary goal of radiation protection in diagnostic radiology. (3)
5. Define two common shielding materials used in radiology. (3)
6. Summarize the concept of filtration in radiography. (3)

OR

What does AEC stand for, and summarize its purpose in radiography? (3)

### Group-C

(Long Answer Type Questions)

5 x 6=30

7. Distinguish TLD badge & FILM badge used in Radiography (5)
8. Write notes on Radiosensitivity. (5)
9. Distinguish stochastic and nonstochastic effects of radiation. (5)
10. Explain the tissue weighting factor and radiation weighting factor. (5)
11. Explain types of radiation exposure in diagnostic radiology. (5)
12. Summarize the ideal feature of radioisotopes. (5)

OR

Explain different units used in radiology to measure the amount of radiation dose. (5)

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