



LIBRARY
Brainware University
Barasat, Kolkata -700125

Term End Examination 2025-2026

Programme – B.Sc.(MRIT)-2022/B.Sc.(MRIT)-2023/B.Sc.(MRIT)-2024

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)

$$1 \times 15 = 15$$

1. Choose the correct alternative from the following :

- (i) Identify what is formed as a result of the loss of radiation energy due to the physical interactions of ionizing radiation with matter through ionization
 - a) Free radicals
 - b) Protons
 - c) Neutron
 - d) Radiation
- (ii) Radiation exposure produces a wide range of lesions in DNA including
 - a) single strand breaks
 - b) Double strand breaks
 - c) Base Damage
 - d) All of these
- (iii) Which of the following trimester associated with mostly radiation effect in the developing stage
 - a) First trimester
 - b) Second Trimester
 - c) Third trimester
 - d) Fourth Trimester
- (iv) What is the recommended radiation dose limit for fetal exposure during a single diagnostic imaging procedure?
 - a) 1 Gy
 - b) No specific limit
 - c) 0.1 Gy
 - d) 0.05 Gy
- (v) Identify the radicals formed after passage of radiation and water radiolysis
 - a) Hydrated electron (eaq-)
 - b) Hydrogen atom (H)
 - c) hydroxyl radical (OH)
 - d) All of these
- (vi) 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
- (vii) The ten-day rule is applicable for
 - a) Females of reproductive age group
 - b) Male of reproductive age group
 - c) Juvenile age group
 - d) Pre-menopause age group

- (viii) The radiation protection principle includes
- Justification
 - optimization
 - Dose Limit
 - All of these
- (ix) Identify the recommended minimum source-to-skin distance (SSD) for mobile radiography?
- 50 cm
 - 100 cm
 - 150 cm
 - 200 cm
- (x) Radiologic technologists often choose exposure factors based on the patient's:
- Age
 - Blood pressure
 - Weight
 - Medical history
- (xi) Radiologic technologists often choose the placement of their personal monitoring device. The most common placement is typically:
- Over the lead apron at the waist level
 - On the chest inside the lead apron
 - On the wrist
 - In the lead apron pocket
- (xii) Radiologic technologists often choose between film badges and TLD badges for personal radiation monitoring. Which type of badge is more commonly used in modern radiography practices?
- Film badge
 - TLD badge
 - Pocket ionization chamber
 - Geiger-Muller counter
- (xiii) Which of the following acts as quenching gas in Geiger Muller counter?
- Alcohol
 - Argon gas
 - Krypton
 - Hydrogen
- (xiv) Identify the annual effective dose for public from all sources
- 1 mSv
 - 1.5 msv
 - 3.5 mSv
 - 6 mSv
- (xv) Select the appropriate unit in which the Roentgen (R) exposure is measured.
- Tissue
 - Water
 - A lab
 - Air

Group-B

(Short Answer Type Questions)

3 x 5=15

- Explain Stochastic effect. (3)
- Explain the fetal effect of radiation. (3)
- Write the advantages of TLD over film badge. (3)
- Explain about radiation protection during mobile radiography? (3)
- Summarize the concept of filter and its significance in radiation protection (3)

OR

Summarize the process of optimization help achieve radiation protection in diagnostic imaging? (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

- Distinguish stochastic and nonstochastic effects of radiation. (5)
- Write a note on area monitoring device. (5)
- Summaries regulatory board intended to maintain the compliances in the radiology department. (5)
- Explain the cardinal principle of radiation protection. (5)
- Explain TEN day rule in context of clinical use in the radiology. (5)
- Distinguish TLD badge & FILM badge used in Radiography (5)

OR

Write notes on Pocket dosimeter and also explain about its feature that make it unique from other dosimeter. (5)

LIBRARY
Brainware University
Barasat, Kolkata -700125