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## BRAINWARE UNIVERSITY

Term End Examination 2023

Programme – B.Sc.(MRIT)-2020

Course Name – Quality Assurance & Radiation Safety (AERB Guidelines) in

Diagnostic Radiology

Course Code - BMRIT601

( Semester VI )

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) Select the correct option, A Geiger counter counts radioactive particles by
  - a) Amplifying the sound theory make as theory strike the walls of tube
  - b) Emitting detectable light pulses when struck
  - c) Collecting and measuring the charges of the particles
  - d) Undergoing a chemical reaction with each incident particle
- (ii) Identify the range ion-chamber is capable of measuring gamma energy
  - a) > 25 keV
  - b) < 25 keV
  - c) 25 keV
  - d) 50 keV
- (iii) Tell the name of radiographic QC procedure that is usually done once a year?
  - a) Retake analysis
  - b) Visual inspection of cleanliness of imaging systems
  - c) Cassette and screen cleaning
  - d) Safelight test
- (iv) Identify the device used for generating beams of waves or particles that have parallel paths?
  - a) USG machine
  - b) FMRI
  - c) ECG
  - d) Collimator
- (v) Identify the tolerance limit of tube leakage radiation at 1 m from the focus is
  - a) >110 mR / hour
  - b) <115 mR/hour
  - c) >115 mR/hour
  - d) None
- (vi) Select tissue weighting factor Gonad according to ICRP 2007
  - a) 0.08
  - b) 0.1
  - c) 0.09
  - d) 0.1
- (vii) Identify Attenuation is define as
  - a) Penetration
  - b) Absorption
  - c) Scattering
  - d) Asorption+ Scattering



9. Classify different record-keeping systems used for quality control in various imaging modalities, including radiography, computed tomography (CT), magnetic resonance imaging (MRI), and ultrasound. (5)
10. Explain the concept of radiation dose optimization, and illustrate the different techniques and strategies used to minimize radiation dose in imaging. (5)
11. Infer the the concept of absorbed dose, and illustrate the differences between absorbed dose, equivalent dose, and effective dose. (5)
12. Distinguish between the different types of DNA damage caused by ionizing radiation, including single-strand breaks, double-strand breaks, and base damage. (5)

**OR**

Classify different mechanisms of cell death caused by ionizing radiation, including apoptosis, necrosis, and mitotic catastrophe. (5)

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