



BRAINWARE UNIVERSITY

Library
Brainware University
398, Ramkrishnapur Road, Barasat
Kolkata, West Bengal-700125

Term End Examination 2025-2026

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

Course Name – Physic of Conventional Radiographic and Imaging Equipment

Course Code - BMRITC303

(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) Choose two most often used TV camera tubes available for television monitoring fluoroscopy are the
 - a) TV Monitor & grid
 - b) OP & II
 - c) Optical Monitor & plumbicon
 - d) Vidicon & plumbicon
- (ii) Select the correct option in the portable X-ray unit, the tank is filled with oil to
 - a) Insulate
 - b) Cool
 - c) Both of these
 - d) None of these
- (iii) Which of the following is the correct definition of scintillator?
 - a) Absorbs light and converts energy to x-rays
 - b) Absorbs light and converts to light
 - c) Absorbs x-rays and converts energy to light
 - d) Absorbs x-rays and converts to carbon
- (iv) Tube support systems available for use in modern diagnostic imaging equipment include; (choose correct option):
 - a) Overhead ceiling support versions
 - b) Floor-to-ceiling support versions
 - c) A, B, and C
 - d) B & C only
- (v) The majority of heat in a modern rotating anode tube is dissipated through the: (choose correct option):
 - a) Conduction of heat through the stem of the anode
 - b) Transfer of the space charge to the anode disk
 - c) Passage of radiant heat to the tube envelope
 - d) Absorption of electrons by the io sink
- (vi) Select the following is used to focus the high speed electron stream toward the target of the anode?
 - a) Lead collar
 - b) Nickel focusing cup
 - c) Copper anode
 - d) Titanium lens
- (vii) The filament circuit contains a _____ transformer.(choose correct option):

- a) Step-up
c) Autotransformer
- b) Step-down
d) High-voltage transformer
- (viii) Select the following components are likely to be found in the primary circuit of a modern x-ray unit? 1. Autotransformer 2. Timer switch 3. The anode of the x-ray tube
- a) 1 and 2
c) 2 and 3
- b) 1 and 3
d) 1, 2, and 3
- (ix) All of the following are advantages of a 3-phase power supply in a modern radiographic unit EXCEPT: (Select correct option)
- a) Shorter permitted exposures
c) Reduced scatter production
- b) Higher beam quality
d) Higher beam intensity
- (x) Identify the anode or target material used in x-ray tube
- a) rhodium
c) tungsten
- b) molybdenum
d) all of the these
- (xi) Select the filter used in mammography
- a) aluminium filter
c) compound filter
- b) k-edge filter
d) inherent filter
- (xii) Identify the effective anode angle in mammography
- a) 6-24 degree
c) 16-30 degree
- b) 0-16 degree
d) 10-24 degree
- (xiii) Select main components of relay?
- a) contacts
c) diode
- b) coil
d) capacitor
- (xiv) Identify the purpose of relay.
- a) To amplify electrical signals
c) To filter electrical noise
- b) To switch electrical circuits on and off
d) To measure electrical resistance
- (xv) Choose the correct full form of CT
- a) Controlled tomography
c) Converted tomography
- b) Computerized tomography
d) Comparison tomography

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Describe the X-ray anode. (3)
3. Describe various components of mobile X-ray unit. (3)
4. Define rectifier and write its types (3)
5. classify the basic elements of control panel (3)
6. Explain stitch radiography. (3)

OR

Explain multi section tomography. (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. State the meters commonly used in X-ray Machine. (5)
8. Justify use of 3phase power generator over single phase generator. (5)
9. Explain the main function of a beam limiting device in X-ray imaging. (5)
10. Can you explain the concept of grid ratio in X-ray grids and how it impacts image quality? (5)
11. Give a detailed explanation of the anode's role in an X-ray tube. (5)
12. Explain the construction of Mobile X-ray equipment? (5)

OR

Write short note on digital breast tomosynthesis(DBT) (5)