

[LB 0212]

AUGUST 2012

Sub. Code: 1403

**DIPLOMA IN RADIOLOGY IMAGING TECHNOLOGY**

**FIRST YEAR**

**PAPER III – X-RAY MACHINES ACCESSORIES**

*Q.P. Code : 841403*

**Time : Three hours**

**Maximum : 100 marks**

**(180 Mins) Answer ALL questions in the same order.**

**I. Elaborate on:**

**Pages Time Marks  
(Max.)(Max.)(Max.)**

- |   |   |    |    |
|---|---|----|----|
| 1. How are x-rays produced? With a suitable diagram describe a Rotating Anode Tube. | 7 | 20 | 10 |
| 2. What are the factors influencing the quality and intensity of x-rays?            | 7 | 20 | 10 |
| 3. Rectification. With a diagram, describe the half-wave rectification circuit.     | 7 | 20 | 10 |

**II. Write Notes on:**

- |                                       |   |   |   |
|---------------------------------------|---|---|---|
| 1. X-ray tube cooling.                | 4 | 9 | 5 |
| 2. Requirements for x-ray production. | 4 | 9 | 5 |
| 3. Properties of x-rays.              | 4 | 9 | 5 |
| 4. The target in an x-ray tube.       | 4 | 9 | 5 |
| 5. Filament circuit.                  | 4 | 9 | 5 |
| 6. Kilovoltage circuit.               | 4 | 9 | 5 |
| 7. Semiconductors.                    | 4 | 9 | 5 |
| 8. Self-rectified x-ray circuit.      | 4 | 9 | 5 |
| 9. Components of x-ray generators.    | 4 | 9 | 5 |
| 10. Stationary anode tube.            | 4 | 9 | 5 |

**III. Short Answers on:**

- |                               |   |   |   |
|-------------------------------|---|---|---|
| 1. Half-value layer (HVL).    | 1 | 3 | 2 |
| 2. Inverse-square law.        | 1 | 3 | 2 |
| 3. Triode.                    | 1 | 3 | 2 |
| 4. Vacuum tube diode.         | 1 | 3 | 2 |
| 5. Types of x-ray generators. | 1 | 3 | 2 |
| 6. Focal spot.                | 1 | 3 | 2 |
| 7. X-ray tube housing.        | 1 | 3 | 2 |
| 8. Earthing.                  | 1 | 3 | 2 |
| 9. Insulators.                | 1 | 3 | 2 |
| 10. Conductors.               | 1 | 3 | 2 |

\*\*\*\*\*

[LC 0212]

FEBRUARY 2013

Sub. Code: 1403

**DIPLOMA IN RADIOLOGY IMAGING TECHNOLOGY**

**FIRST YEAR**

**PAPER III – X-RAY MACHINES ACCESSORIES**

*Q.P. Code : 841403*

**Time : Three hours**

**Maximum : 100 marks**

**Answer ALL questions.**

**I. Elaborate on:**

**(3x10=30)**

1. What are x-rays? With a suitable diagram describe the Stationary Anode Tube/
2. What is rectification? With a diagram describe the Half-Wave Rectification Circuit.
3. What are the components of an x-ray generator? Explain “quality” and “intensity” of an x-ray beam. What are the factors that affect the quality of an x-ray beam?

**II. Write Notes on:**

**(10x5=50)**

1. Rotating Anode Tube.
2. Self-Rectification Circuit.
3. Requirements for x-ray production.
4. Cooling of an x-ray tube.
5. Filament circuit.
6. Kilovoltage circuit.
7. Characteristics of the Anode (Target Electrode) in an x-ray tube.
8. Characteristic x-rays.
9. Interaction of electrons with the target.
10. Triode.

**III. Short Answers on:**

**(10x2=20)**

1. Thermionic Emission Process.
2. Focal Spot.
3. Heel Effect.
4. Space Charge Effect.
5. X-ray Spectra.
6. Inverse Square Law.
7. Half Value Layer (HVL).
8. Line Focus Principle.
9. Role of vacuum in x-ray tubes.
10. Earthing.

\*\*\*\*\*

[LD 0212]

AUGUST 2013

Sub. Code: 1403

DIPLOMA IN RADIOLOGY IMAGING TECHNOLOGY

FIRST YEAR

PAPER III – X-RAY MACHINES ACCESSORIES

*Q.P. Code : 841403*

**Time: Three Hours**

**Maximum: 100 Marks**

**Answer all questions**

**I Elaborate on**

**3 x 10 = 30**

1. Briefly explain the Factors Influencing the Quality and Quantity of X-Rays.
2. Describe in detail the properties of X-Rays.
3. Explain in detail the construction and working principles of Rotating Anode X-Ray tube.

**II Write notes on**

**10 x 5 = 50**

1. Off Focus Radiation
2. Effects of X-Rays
3. Mammography X-Ray tube
4. Half wave Rectifier Circuit
5. X-Ray Tube Housing
6. Vacuum Triode
7. Collimators
8. Step-up Transformer
9. Photo Electric effect
10. Line Focus Principle

**III Write short answer on**

**10 x 2 = 20**

1. Thermionic Emission
2. Toggle Switch
3. Voltmeter
4. Ionisation
5. Gamma-Rays
6. Aperture Diaphragms
7. Heel effect
8. Inverse-square Law
9. Focal spot
10. Multipulse X-Ray Unit

\*\*\*