[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**

Answer ALL questions in the same order.

I. Elaborate on:	**Pages (Max.)**	**Time (Max.)**	**Marks (Max.)**
1. How are x-rays produced? With a suitable diagram describe a Rotating Anode Tube.	7	20 min.	10
2. What are the factors influencing the quality and intensity of x-rays?	7	20 min.	10
3. Rectification. With a diagram, describe the half-wave rectification circuit.	7	20 min.	10
II. Write Notes on:			
1. X-ray tube cooling.	4	9 min.	5
2. Requirements for x-ray production.	4	9 min.	5
3. Properties of x-rays.	4	9 min.	5
4. The target in an x-ray tube.	4	9 min.	5
5. Filament circuit.	4	9 min.	5
6. Kilovoltage circuit.	4	9 min.	5
7. Semiconductors.	4	9 min.	5
8. Self-rectified x-ray circuit.	4	9 min.	5
9. Components of x-ray generators.	4	9 min.	5
10. Stationary anode tube.	4	9 min.	5
III. Short Answers on:			
1. Half-value layer (HVL).	1	3 min.	2
2. Inverse-square law.	1	3 min.	2
3. Triode.	1	3 min.	2
4. Vacuum tube diode.	1	3 min.	2
5. Types of x-ray generators.	1	3 min.	2
6. Focal spot.	1	3 min.	2
7. X-ray tube housing.	1	3 min.	2
8. Earthing.	1	3 min.	2
9. Insulators.	1	3 min.	2
10. Conductors.	1	3 min.	2

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[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: **(3 x 10 = 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: **(10 x 5 = 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: **(10 x 2 = 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.

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[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. Short Answers 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.

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[LF 0212] **AUGUST 2014** **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. What is transformer? Explain in detail about step-up, step-down and Auto Transformer.
2. Explain in detail of Modern X-Ray tube construction and working principles.
3. Explain in detail of Image Intensifying Tube (I I Tube) construction and working principle.

II. Write notes on: **(10 x 5 = 50)**

1. Half wave rectifier circuit.
2. X-Ray tube collimation.
3. Pottor Bucky System.
4. Tube rating chart.
5. X-Ray tube housing.
6. Generations of X-ray tube.
7. Diode.
8. M.M.R. - Mass Miniature Radiography.
9. A.E.C. - Automatic Exposure Control.
10. H.T. Transformer.

III. Short Answers on: **(10 x 2 = 20)**

1. Anode heel effect.
2. Inverse-square law.
3. Gamma-Rays.
4. Grids.
5. Tube cooling system.
6. Ionisation.
7. Large focal spot.
8. Volt meter.
9. X-ray couch.
10. Photo timer.

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[LG 0215] **FEBRUARY 2015** **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. Explain in detail of Image Intensifying Tube (II Tube) construction and working principle.
2. What is transformer? Explain in detail about step-up, step-down and Auto Transformer.
3. Explain in detail of Modern X-Ray tube construction and working principles.

II. Write notes on: **(10 x 5 = 50)**

1. X-Ray tube collimation.
2. Half wave rectifier circuit.
3. Tube rating chart.
4. Pottor Bucky System.
5. Generations of X-ray tube.
6. X-Ray tube housing.
7. M.M.R. - Mass Miniature Radiography.
8. Diode.
9. H.T. Transformer.
10. A.E.C. - Automatic Exposure Control.

III. Short Answers on: **(10 x 2 = 20)**

1. Inverse-square law.
2. Anode heel effect.
3. Gamma-Rays.
4. Tube cooling system.
5. Grids.
6. Large focal spot.
7. Ionisation.
8. Photo timer.
9. Volt meter.
10. X-ray couch.

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[LH 0815] **AUGUST 2015** **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. Discuss in detail the working and construction of rotating anode x-ray tube.
2. Write a short note on conventional fluoroscopy. Explain the working and construction of image intensifier.
3. What is a transformer? Explain in detail about step-up, step-down & Auto Transformer.

II. Write notes on: **(10 x 5 = 50)**

1. Collimator.
2. Reasons for grid cut-off.
3. Full wave rectifier.
4. Electronic timer.
5. Anode heel effect and line focus principle.
6. Filament circuit.
7. Self rectifier.
8. Crookes tube.
9. Cathode ray oscilloscope.
10. Method of anode cooling.

III. Short Answers on: **(10 x 2 = 20)**

1. Grid.
2. Inverse square law.
3. Rectifier.
4. Automatic exposure control.
5. Phosphorescence.
6. Triode valve.
7. Filament.
8. Ammeter.
9. Galvanometer.
10. Semiconductor.

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[LI 0216] **FEBRUARY 2016** **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. X-ray tube with suitable diagram.
2. Screens – their structure and types.
3. Automatic film processor and techniques.

II. Write notes on: **(10 x 5 = 50)**

1. Anode heel effect.
2. Various methods of printing of images in radiology.
3. Filters and their uses.
4. Grids.
5. Types of cassettes.
6. Image Intensifier Tube.
7. Artifacts during film processing.
8. X-ray circuits.
9. MA and KV
10. Types of x-ray films.

III. Short Answers on: **(10 x 2 = 20)**

1. Types of anode.
2. Thermionic emission.
3. Steps of manual film processing
4. Phosphurs used in screens.
5. Self rectifying circuit.
6. Xray beam quality.
7. Types of cassette.
8. Exposure time.
9. Advantages of automatic film processing over manual method.
10. Fluoroscence.

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[LJ 0816] **AUGUST 2016** **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. Principles of rotating anode in X-ray tube. Draw and explain in detail.
2. Factors affecting the quality and intensity of X-rays.
3. Filters and their uses.

II. Write notes on: **(10 x 5 = 50)**

1. Properties of X-rays.
2. Focussing cup.
3. Scatter radiation.
4. Auto transformer.
5. Half wave rectifier.
6. Phototimer.
7. Space charge effect.
8. Characteristic X-rays.
9. Types of collimators.
10. Filament circuit.

III. Short answers on: **(10 x 2 = 20)**

1. Heel effect.
2. Half value layer.
3. Focal spot size.
4. Anode angle.
5. Types of grid.
6. Transformer efficiency.
7. Thermionic emission.
8. Core of transformer.
9. X-ray tube cooling.
10. Three phase X-ray generator.

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[LK 0217] FEBRUARY 2017 **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. Draw and explain the parts of modern X-ray tube.
2. Generators used in radiology.
3. Collimators – their uses and types.

II. Write notes on: **(10 x 5 = 50)**

1. Anode angle.
2. Uses of filters.
3. Transformer rating.
4. X-ray tube housing.
5. Full wave rectifier circuit.
6. Thyristor.
7. X-ray beam quality.
8. Focal spot size.
9. Grids and their types.
10. Advantage of Focussing cup.

III. Short answers on: **(10 x 2 = 20)**

1. Phototimers.
2. Line focus principle.
3. Space charge effect.
4. Types of anode.
5. X-ray tube cooling.
6. Scatter radiation.
7. Filament circuit.
8. Image intensifier tube.
9. Heat loading.
10. Thermionic emission.

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[LL 0817] AUGUST 2017 **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. Explain in detail the factors Influencing the Quality and Quantity of X-rays.
2. With a clean Diagram, describe Rectification, Half – Wave and Full – Wave Rectification Circuit.
3. Describe in details about the Beam Limiting Devices and its Uses in Radiology.

II. Write notes on: **(10 x 5 = 50)**

1. X-Ray tube Housing.
2. Focusing Cup.
3. Filament Circuit.
4. Triode.
5. Components of Generator.
6. Properties of X-rays.
7. Automatic Exposure Control.
8. Auto – Transformer.
9. Grids.
10. Space Charge Effect.

III. Short answers on: **(10 x 2 = 20)**

1. Inverse Square Law.
2. Ammeter.
3. Ionization.
4. Anode Heel Effect.
5. Focal spot.
6. Transformer Efficiency.
7. Thermionic Emission.
8. Anode angle.
9. Advantage of 3 – phase Generator.
10. Fluorescence.

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[LM 0218] FEBRUARY 2018 **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. Explain in detail of Image Intensifying Tube (I.I. Tube) Construction and Working principle.
2. What are the Components of an X-ray Generator? Explain in detail about the Kilo-voltage Circuit.
3. What is Transformer? Explain in detail about the step-up, step-down and Auto- transformer.

II. Write notes on: **(10 x 5 = 50)**

1. X-Ray tube Cooling.
2. Target in X-ray tube.
3. Filament Circuit.
4. Semi – Conductors.
5. Stationary Anode X-ray tube.
6. Filters and its uses.
7. Line Focus principle.
8. Potter – Bucky System.
9. Diode.
10. Collimators.

III. Short answers on: **(10 x 2 = 20)**

1. Automatic Exposure Control.
2. Filament.
3. Voltmeter.
4. Fluorescence.
5. Rectifier.
6. Conductors.
7. Half – Value Layer (HVL).
8. Thermionic Emission.
9. X – Ray Cassette.
10. Exposure Timer.

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[LN 0818] AUGUST 2018 **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. Explain in detail of Modern X-Ray tube, construction and working principle.
2. What is conventional fluoroscopy? Explain the working principle and construction of Image Intensifier (I.I).
3. Discuss in detail about the Transformer. Explain about step-up, step-down and Auto-Transformer.

II. Write notes on: **(10 x 5 = 50)**

1. Full – wave Rectification.
2. Photo Timer.
3. Cathode – Ray Oscilloscope.
4. X – ray tube Housing.
5. Off – focus principle.
6. Filters and its uses.
7. MA and KV.
8. Mammography X –ray tube.
9. Characteristic X– rays.
10. Focusing Cup.

III. Short answers on: **(10 x 2 = 20)**

1. Anode angle.
2. Heel Effect.
3. Three – phase Generator.
4. Scatter Radiation.
5. Thermionic Emission.
6. Semi – Conductors.
7. Triode.
8. Inverse Square Law.
9. Transformer efficiency.
10. Aperture Diaphragm.

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[LO 0219] FEBRUARY 2019 **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. Explain in detail of Image Intensifying Tube (I.I. Tube) construction and working principle.
2. How are x-rays produced? With a suitable diagram describe a Rotating Anode Tube.
3. Rectification. With a diagram, describe the half-wave rectification circuit.

II. Write notes on: **(10 x 5 = 50)**

1. Filament Circuit.
2. Potter – Bucky system.
3. M.M.R. – Mass Miniature Radiography.
4. Requirements for x-ray production.
5. Kilo voltage circuit.
6. Interaction of electrons with the target.
7. Anode heel effect.
8. Artifacts during film processing.
9. Full wave rectifier circuit.
10. X-ray beam quality.

III. Short answers on: **(10 x 2 = 20)**

1. Automatic Exposure Control.
2. Thermionic Emission.
3. Tube Cooling System.
4. Types of x-ray generators.
5. Conductors.
6. Inverse Square law.
7. Steps of manual film processing.
8. Advantages of automatic film processing over manual method.
9. Line focus principle.
10. Scatter radiation.

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