Question Paper

Exam Date & Time: 18-Mar-2025 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST SEMESTER BSc. MEDICAL IMAGING TECHNOLOGY DEGREE EXAMINATION - MARCH 2025
SUBJECT: MIT1301 - RADIATION PHYSICS
(2024 SCHEME)

Marks: 100 **Duration: 180 mins.**

Answer all the questions.

1)	Explain in detail the various interactions of X-rays with matter.	(20)
2)	Explain the construction of X-ray tube. Add a note on anode heel effect.	(20)
3)	Explain the semiconductor rectifiers used in the X-ray Circuit.	(10)
4)	Explain the working of different types of X-ray generators.	(10)
5A)	List the properties of Electromagnetic Radiation.	(5)
5B)	Explain Linear attenuation coefficient.	(5)
5C)	Explain Half value layer.	(5)
5D)	Explain K-Edge filter.	(5)
5E)	Explain Clinical significances of magnification.	(5)
5F)	List the function of X-ray beam restrictors.	(5)
6A)	Define Radioactivity.	(2)
6B)	Define X-ray beam restrictors.	(2)
6C)	Define Autotransformer.	(2)
6D)	Define Grid ratio.	(2)
6E)	Define Distortion.	(2)

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Question Paper

Exam Date & Time: 20-Mar-2025 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST SEMESTER BSc. MEDICAL IMAGING TECHNOLOGY DEGREE EXAMINATION - MARCH 2025
SUBJECT: MIT1302 - RADIOGRAPHIC POSITIONING AND TECHNIQUES - I
(2024 SCHEME)

Marks: 100 **Duration: 180 mins.**

Answer all the questions.

1)	Describe the indications, patient preparation, positioning, technical factors, criteria for evaluating the quality of the resulting radiograph, and the radiation protection methods to be used during the examination of the Anterior-Posterior, Oblique and Lateral projections foot.	(20)
2)	Describe the indications, patient preparation, positioning, technical factors, criteria for evaluating the quality of the resulting radiograph, and the radiation protection methods to be used during the examination of the Posterior Anterior, Posterior Anterior oblique, and Lateral projections of the Hand.	(20)
3)	Describe the indications, technical factors, and criteria for evaluating the quality of the resulting radiograph of the Carpal canal inferiosuperior Gaynor - hart method.	(10)
4)	Describe the indications, technical factors, and criteria for evaluating the quality of the resulting radiograph of the Anterior-Posterior lordotic projection.	(10)
5A)	Explain the step-wise process of positioning for the basic projection of Humerus.	(5)
5B)	Explain the step-wise process of positioning for basic projection of the PA wrist.	(5)
5C)	List the radiographic projection taken for trauma routine of shoulder joint. Explain the step-wise positioning for Transthoracic lateral (Lawrence method).	(5)
5D)	Explain the Radial deviation and ulnar deviation projection of the Wrist joint.	(5)
5E)	Explain the step-wise process of positioning for basic projection of the thumb AP.	(5)
5F)	Explain the structures and evaluation criteria for basic projections of Knee joint.	(5)
6A)	List the various anatomical terminology.	(2)
6B)	Define density.	(2)
6C)	Outline the radiation protection method used for chest PA.	(2)
6D)	Select the appropriate radiographic exposure factors for basic AP shoulder joint.	(2)
6E)	Explain the image evaluation criteria of Calcaneus Lateral.	(2)

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MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST SEMESTER BSc. MEDICAL IMAGING TECHNOLOGY DEGREE EXAMINATION - MARCH 2025
SUBJECT: MIT1101 - RADIATION PHYSICS
(2020 SCHEME)

Marks: 100 **Duration: 180 mins.**

Answer all the questions.

1)	Explain in detail of medium frequency, battery-powered and falling load generator	(20)
2)	Explain the Construction of the X-ray tube in detail with a labled diagram. Add a note on rotating anode X-ray tube	(20)
3)	Discuss in detail the principle and application of rectifiers in x-ray production.	(10)
4)	Define Inherent and added filters. Effect on the quality of the spectrum in detail.	(10)
5A)	Explain the Wave concept and particle concept of electromagnetic radiation	(5)
5B)	Explain x-ray beam restrictors.	(5)
5C)	Explain the evaluation of grid performance	(5)
5D)	Explain in detail of Photoelectric effect	(5)
5E)	Explain the electromagnetic spectrum with a diagram	(5)
5F)	Discuss the Factors affecting the quality of X-ray	(5)
6A)	Define Radioactivity with one example	(2)
6B)	Define types of grids	(2)
6C)	Define the Anode heel effect	(2)
6D)	Define the basic principle of transformers	(2)
6E)	Define linear attenuation coefficient	(2)

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Question Paper

Exam Date & Time: 20-Mar-2025 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST SEMESTER BSc. MEDICAL IMAGING TECHNOLOGY DEGREE EXAMINATION - MARCH 2025
SUBJECT: MIT1102 - RADIOGRAPHIC POSITIONING AND TECHNIQUES - I
(2020 SCHEME)

Marks: 100 **Duration: 180 mins.**

Answer all the questions.

1)	Describe the anatomy of the Ankle Joint. Explain in detail the standard projection taken for Calcaneus bone.	(20)
2)	List the radiographic projection taken for trauma routine of shoulder joint. Explain in detail Transthoracic lateral (Lawrence method)	(20)
3)	Explain in detail the anatomical planes and positioning terminology	(10)
4)	Explain in detail the basic projection taken for the Chest.	(10)
5A)	Explain the image evaluation and structure seen in the Norgaard method.	(5)
5B)	Explain the Radial deviation and ulnar deviation projection of the Wrist joint	(5)
5C)	Explain the clinical indications and preparation of the patient for Folio method	(5)
5D)	List the Significance of grid with respect to image quality	(5)
5E)	Explain the image evaluation and structure seen in the Anterior Posterior projection of the leg	(5)
5F)	Explain the clinical indications and preparation of the patient for Anterior Posterior - Lordotic Projection	(5)
6A)	List the Carpel bones	(2)
6B)	Select the technical exposure factors for Anterior Posterior Oblique projection of thumb	(2)
6C)	Define Sharpness and Resolution	(2)
6D)	Select the technical exposure factors for Knee Lateral projection	(2)
6E)	Define Milli ampere per second	(2)

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