

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0222]

**FEBRUARY 2022
(OCTOBER 2021 EXAM SESSION)**

Sub. Code: 4016

M.Sc. MEDICAL PHYSICS

FIRST YEAR

(Candidates admitted from 2010-2011 onwards – Paper VI)

(Candidates admitted from 2020-2021 onwards – Paper VII)

PAPER VI & VII – PHYSICS OF MEDICAL IMAGING

Q.P. Code : 284016

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate notes on:

(2 x 20 = 40)

1. a) Give the details about the instruments used in Mammography.
b) Explain in detail about indirect and direct digital radiography.
2. Write the different quality assurance tests which are used to evaluate the Conventional x-ray equipments.

II. Write Short Notes on:

(10x6 = 60)

1. Explain in detail about Photoelectric effect.
2. Image intensifier.
3. Bremsstrahlung X-Rays.
4. Grid ratio.
5. Automatic exposure control.
6. Continuous and Characteristic spectra.
7. Color Doppler.
8. Interactions of x-rays with matter.
9. Role of filters in imaging.
10. MRI artifacts.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1022]

OCTOBER 2022

Sub. Code: 4016

M.Sc. MEDICAL PHYSICS

FIRST YEAR

(Candidates admitted from 2010-2011 onwards – Paper - VI)

(Candidates admitted from 2020-2021 onwards - Paper - VII)

PAPER VI & VII – PHYSICS OF MEDICAL IMAGING

Q.P. Code: 284016

Time: 3 hours

Maximum: 100 marks

Answer All Questions

I. Elaborate notes on:

(2 x 20 = 40)

1. What is an image intensifier? Explain the construction and working of the Different components of an image intensifier.
2. Explain in detail the principle of magnetic resonance imaging and the function of encoding gradient coils.

II. Write short notes on:

(10 x 6 = 60)

1. Principle of computed tomography and pitch factor.
2. Radiographic film and H and D curve.
3. Space charge effect.
4. Single phase and three phase rectification for x-ray tube.
5. Mammography.
6. Quality Assurance of CT scanner.
7. Contrast to Noise ratio.
8. T1 and T2 weighted images.
9. Line focus principle.
10. Doppler ultrasound.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1023]

OCTOBER 2023

Sub. Code: 4016

**M.Sc. MEDICAL PHYSICS
FIRST YEAR (From 2020-2021 onwards)
PAPER VII – PHYSICS OF MEDICAL IMAGING**

Q.P. Code: 284016

Time: Three hours

Answer All Questions

Maximum: 100 marks

I. Elaborate notes on:

(2 x 20 = 40)

1. Give the principle of X-ray production and explain in detail the construction and working of a stationary anode X-ray tube. List its disadvantages.
2. Describe in detail the different modes in Ultrasound imaging and list the applications of this imaging modality in medicine.

II. Write short notes on:

(10 x 6 = 60)

1. Inherent and added filters.
2. Patient dose versus image quality.
3. Sensitometric parameters of film.
4. Anode heel effect.
5. Intensifying screens and its applications.
6. Modulation Transfer Function.
7. Different types of Unsharpness in image quality.
8. Orthopantomography and its applications.
9. Superconducting magnets in Magnetic Resonance Imaging.
10. Safety in Magnetic Resonance Imaging.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1024]

OCTOBER 2024

Sub. Code: 4016

**M.Sc. MEDICAL PHYSICS
FIRST YEAR (From 2020-2021 onwards)
PAPER VII – PHYSICS OF MEDICAL IMAGING**

Q.P. Code: 284016

Time: Three hours

Answer All Questions

Maximum: 100 marks

I. Elaborate notes on:

(2 x 20 = 40)

1. How is a Magnetic Resonance image (MRI) formed? Explain about T1 and T2 weighted MRI imaging.
2. What is the purpose of QA? Explain the QA tests that have to be done for performance evaluation of a diagnostic X-ray diagnostic system.

II. Write short notes on:

(10 x 6 = 60)

1. Generations of Computed Tomography.
2. Hurter and Driffield (H and D) curve.
3. Hooded anode X-ray tube.
4. Automatic brightness control and its advantages.
5. Half wave and full wave rectifiers.
6. Quality assurance of film developer.
7. Point spread function and edge spread function.
8. Conventional tomography.
9. Grid performance evaluation parameters.
10. Production of ultrasound.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1025]

OCTOBER 2025

Sub. Code: 4016

**M.Sc. MEDICAL PHYSICS
FIRST YEAR (From 2020-2021 onwards)
PAPER VII – PHYSICS OF MEDICAL IMAGING**

Q.P. Code: 284016

Time: Three hours

Answer All Questions

Maximum: 100 marks

I. Elaborate notes on:

(2 x 20 = 40)

1. Explain in detail about Magnetic resonance Imaging.
2. Explain about X-Ray Tube – Type, Electric accessories and Function etc.

II. Write short notes on:

(10 x 6 = 60)

1. Fluoroscopy.
2. Tomography.
3. Transducers in Ultrasound.
4. Transformers.
5. Quality Assurance protocols for Conventional X-ray equipment.
6. Single and Double coating X-ray films.
7. Function of Grid in Diagnostic Radiography.
8. Factors influencing in Radiographic contrast.
9. Film processing in Dark room.
10. Scatter reduction methods in Radiography.
