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

[AHS 0222] **FEBRUARY 2022** **Sub. Code: 2402**
(OCTOBER 2021 EXAM SESSION)

M.Sc. RADIOTHERAPHY TECHNOLOGY
FIRST YEAR
(Candidates admitted from 2019-2020 onwards – Paper II)
(Candidates admitted from 2020-2021 onwards – Paper III)
PAPER II & III – IMAGING MODALITIES, EQUIPMENT OPERATION SAFETY AND MAINTENANCE RELATED TO RADIOTHERAPY AND MEDICAL PHYSICS
Q.P. Code : 282402

Time: Three hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate notes on: **(2 x 20 = 40)**

1. Explain different types of ion chambers with suitable diagrams.
2. What is workload, Occupancy and Use factor? Explain with suitable diagrams the barrier calculations of a 6MV linear accelerator.

II. Write Short Notes on: **(10x6 = 60)**

1. Explain the effect of voltage and current on the intensity of X – rays with suitable figures.
2. Write the occupational dose limits in detail.
3. What is shutter error? How will you measure and correct it?
4. Explain Somatic effects and hereditary effects.
5. Write the principles of Thermo Luminescence Dosimeters and their use in personnel monitoring badges with suitable diagrams
6. Write a notes on Telecobalt source and HDR brachytherapy source.
7. Compare stationary and rotating anode X-ray tubes
8. Define and explain exposure, kerma and absorbed dose and its relationship
9. What is primary standard? Explain in detail.
10. Explain with suitable diagram free air chamber.

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

[AHS 1022] **OCTOBER 2022** **Sub. Code: 2402**

M.Sc. RADIOTHERAPHY TECHNOLOGY
FIRST YEAR
(Candidates admitted from 2019-2020 onwards – Paper II)
(Candidates admitted from 2020-2021 onwards – Paper III)
PAPER II & III – IMAGING MODALITIES, EQUIPMENT OPERATION SAFETY AND MAINTENANCE RELATED TO RADIOTHERAPY AND MEDICAL PHYSICS

Q.P. Code : 282402

Time: Three hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate notes on: **(2 x 20 = 40)**

1. Briefly explain photoelectric effect, Compton effects and pair production and relative importance of each other.

2. What is workload, Occupancy and Use factor? Explain with suitable diagrams the barrier calculations of a 6MV linear accelerator.

II. Write Short Notes on: **(10x6 = 60)**

1. Define the term radiation. Compare X – rays and gamma rays. Explain the three types of half-life.
2. Write the occupational dose limits in detail.
3. Define and Explain: Exposure, Kerma and absorbed dose and its relationship.
4. Define the following: organ dose, equivalent dose, effective dose, committed dose and collective dose.
5. Write in detail with suitable diagram the Thermo Luminescence Dosimeters (TLD) and Optically Stimulated Luminescence Dosimeter (OSLD).
6. Explain in detail the philosophy of radiation protection.
7. What is primary standard? Explain in detail?
8. What is heel effect? How will you compensate it? Explain clinical importance.
9. Explain with suitable diagram free air chamber.
10. Explain Somatic effects and Hereditary effects.

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

[AHS 1023] **OCTOBER 2023** **Sub. Code: 2402**

M.Sc. RADIOTHERAPY TECHNOLOGY
FIRST YEAR (From 2020-2021 onwards)
PAPER III – IMAGING MODALITIES, EQUIPMENT OPERATION SAFETY AND MAINTENANCE RELATED TO RADIOTHERAPY AND MEDICAL PHYSICS

Q.P. Code: 282402

Time: Three hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate notes on: **(2 x 20 = 40)**

1. Explain in detail influence quantities in ionization chamber dosimetry measurements.

2. Explain with layout the barrier calculations of a 6MV Linear accelerator.

II. Write Short Notes on: **(10x6 = 60)**

1. Principle of Gas Filled Detectors.
2. What is shutter error? How will you measure and correct it?
3. Explain the three types of half-life.
4. Explain Somatic effects and hereditary effects.
5. Explain different types of ion chambers with suitable diagrams.
6. Explain Beta ray applicators.
7. Describe and compare Ir-192 and Cobalt 60 HDR brachytherapy source.
8. Write a note on thermal and fast neutrons and explain the similarities.
9. What is cavity theory? Explain in detail.
10. Philosophy of radiation protection.

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