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

[MD 0524] **MAY 2024** **Sub. Code: 4077**

M.D. DEGREE EXAMINATION

BRANCH XXVI - RADIATION ONCOLOGY

PAPER I – BASIC PRINCIPLES IN PRACTICE OF RADIOTHERAPY (PHYSICS, BIOLOGY, PATHOLOGY, EQUIPMENTS AND TECHNIQUES OF RADIOTHERAPY)

Q.P. Code: 204077

Time: Three Hours **Maximum: 100 Marks**

I. Elaborate on: **(2 x 15 = 30)**

1. Electron Beam characteristics and clinical application.
2. 6R"S in Radiation Treatment.

II. Write notes on: **(10 x 7 = 70)**

1. Manchester System.
2. Percentage depth dose.
3. Wedges.
4. Tomotherapy.
5. Radiation cataractogenesis.
6. Bragg Peak.
7. Concomitant Boost.
8. Cell Cycle relevant to Radiation.
9. Dose limits to Public and Occupational Worker.
10. Adaptive Radiotherapy.

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

[MD 1224] **DECEMBER 2024** **Sub. Code: 4077**
(OCTOBER 2024 EXAM SESSION)

M.D. DEGREE EXAMINATION

RADIO THERAPY
RADIATION ONCOLOGY
PAPER I – BASIC PRINCIPLES IN PRACTICE OF RADIOTHERAPY
(PHYSICS, BIOLOGY, PATHOLOGY, EQUIPMENTS
AND TECHNIQUES OF RADIOTHERAPY)

Q.P. Code: 204077

Time: Three Hours **Maximum: 100 Marks**

I. Elaborate on: **(2 x 15 = 30)**

1. Discuss interaction of energy with matter. Highlight its importance in clinical practice.
2. Describe in detail, the different temporary interstitial brachytherapy dosage systems.

II. Write notes on: **(10 x 7 = 70)**

1. Stochastic effects of Radiation.
2. Radiobiological effects of Radiation.
3. ICRU – 38.
4. Iridium – 192.
5. Linear quadratic Model.
6. Immobilization devices.
7. Proton therapy
8. Hypofractionation and its effects on late responding tissues,
9. Interaction between Chemotherapy and Radiotherapy.
10. Benefits of concomitant boost therapy with respect to radiobiology.

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

[MD 1025] **OCTOBER 2025** **Sub. Code: 4077**

M.D. DEGREE EXAMINATION

RADIO THERAPY

RADIATION ONCOLOGY

PAPER I – BASIC PRINCIPLES IN PRACTICE OF RADIOTHERAPY (PHYSICS, BIOLOGY, PATHOLOGY, EQUIPMENTS AND TECHNIQUES OF RADIOTHERAPY)

Q.P. Code: 204077

Time: Three Hours **Maximum: 100 Marks**

I. Elaborate on: **(2 x 15 = 30)**

1. Describe Total Body Irradiation (TBI) in detail.
2. Draw and explain the mammalian cell survival curve. Write about the mathematical models describing the cell survival curve.

II. Write notes on: **(10 x 7 = 70)**

1. Maximum permissible dose.
2. Low level radiation effects.
3. Portal imaging.
4. Inverse dose rate effect.
5. Volumetric Modulated Arc Radiotherapy (VMAT).
6. Beam modifying devices.
7. Radiation Induced Cell Death.
8. Describe the Quality Assurance.
9. Respiratory gating techniques.
10. Radiation Protection.

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

[MD 0526] **MAY 2026** **Sub. Code: 4077**

M.D. DEGREE EXAMINATION

RADIO THERAPY

RADIATION ONCOLOGY

PAPER I – BASIC PRINCIPLES IN PRACTICE OF RADIOTHERAPY (PHYSICS, BIOLOGY, PATHOLOGY, EQUIPMENTS AND TECHNIQUES OF RADIOTHERAPY)

Q.P. Code: 204077

Time: Three Hours **Maximum: 100 Marks**

I. Elaborate on: **(2 x 15 = 30)**

1. Give an account of Radiation protection as relevant to radiation oncology.
2. Define Brachytherapy. Describe the Radiobiological rationale for brachytherapy. What are the advantages of HDR brachytherapy over LDR brachytherapy?

II. Write notes on: **(10 x 7 = 70)**

1. Multileaf collimators.
2. Linear energy transfer.
3. Thermoluminescent dosimeter (TLD).
4. Beam direction devices.
5. Intensity Modulated Radiotherapy.
6. Total Body Radiation.
7. Relative biological effect.
8. Radiation induced abscopal effect.
9. Sublethal damage and Potentially lethal damage.
10. Electronic portal imaging devices.

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

[MD 0926] **SEPTEMBER 2026** **Sub. Code: 4077**

M.D. DEGREE EXAMINATION

RADIO THERAPY / RADIATION ONCOLOGY

PAPER I – BASIC PRINCIPLES IN PRACTICE OF RADIOTHERAPY (PHYSICS, BIOLOGY, PATHOLOGY, EQUIPMENTS AND TECHNIQUES OF RADIOTHERAPY)

Q.P. Code: 204077

Time: Three Hours **Maximum: 100 Marks**

I. Elaborate on: **(2 x 15 = 30)**

1. Discuss in detail about Linear accelerator with its applications and limitations.
2. Discuss in detail about Radiation induced Pneumonitis and its management.

II. Write notes on: **(10 x 7 = 70)**

1. Boron neutron capture theory.
2. Rationale of combining Radiotherapy and Immunotherapy.
3. Bolus.
4. Radiation induced chromosomal aberrations.
5. Beam modifying and beam directing devices.
6. Hyperthermia.
7. ICRU 38.
8. Personal monitoring devices.
9. DVH.
10. Brachytherapy QA.

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