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

[AHS 0122] **JANUARY 2022** **Sub. Code: 2411**

(OCTOBER 2021 EXAM SESSION)

M.Sc. RADIOTHERAPY TECHNOLOGY

SECOND YEAR (From 2019-2020 onwards)

PAPER I – CLINICAL BIOLOGY, RADIATION TOXICITIES, STEREOTACTIC RADIOTHERAPY, RADIO SURGERY, SBRT RADIOTHERAPY

Q.P. Code : **282411**

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

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

1. Define SRT, SRS, SBRT.
2. Discuss particulate radiation – types and any one in detail.

II. Write notes on: **(10 x 6 = 60)**

1. Directly ionizing radiation.
2. Explain DNA strand breaks with diagrams where necessary.
3. Explain with diagram cell survival curve for mammalian cells.
4. Radio sensitivity.
5. Classify radiation damage and explain lethal damage.
6. Discuss OER.
7. Stochastic effect.
8. Discuss late radiation toxicities in skin.
9. Explain time dose fractionation model or LQ model.
10. Hyperfractionation.

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

[AHS 0522] **MAY 2022** **Sub. Code: 2411**

M.Sc. RADIOTHERAPY TECHNOLOGY
SECOND YEAR (From 2019-2020 onwards)
PAPER I – CLINICAL BIOLOGY, RADIATION TOXICITIES, STEREOTACTIC RADIOTHERAPY, RADIO SURGERY, SBRT RADIOTHERAPY
Q.P. Code : **282411**

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

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

1. Discuss Quality Assurance in SRT.

2. Compare characteristics of X-Rays and protons.

II. Write notes on: **(10 x 6 = 60)**

1. Direct and indirect action of radiation.
2. Discuss oxygen effect.
3. What is inverse dose effect – explain.
4. Radiation protectors.
5. Potentially lethal damage.
6. Discuss RBE.
7. Radiation carcinogenesis.
8. Discuss radiation toxicities in gastrointestinal tract.
9. Discuss equivalent dose and effective dose.
10. Explain therapeutic ratio.

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

[AHS 1022] **OCTOBER 2022** **Sub. Code: 2411**

M.Sc. RADIOTHERAPY TECHNOLOGY
SECOND YEAR
(Candidates admitted from 2019-2020 onwards)
(Candidates admitted from 2020-2021 onwards)
PAPER I – CLINICAL BIOLOGY, RADIATION TOXICITIES, STEREOTACTIC RADIOTHERAPY, RADIO SURGERY, SBRT RADIOTHERAPY

Q.P Code: 282411

Time: Three hours **Maximum : 100 Marks**

Answer ALL Questions

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

1. Explain all the 6Rs of Radiobiology.

2. Explain Physical aspects of Stereotactic Body Radiotherapy (SBRT).

II. Write notes on: **(10 x 6 = 60)**

1. Cell Survival curve.
2. RBE (Relative Biological Effectiveness).
3. NTCP (Normal Tissue Complication Probability).
4. Radiobiology of hypofractionation.
5. Late radiation toxicities of skin.
6. Early reacting tissues.
7. Patient scheduling and management in SBRT.
8. SRS using gamma knife.
9. Biological Equivalent Dose.
10. Radiation toxicities in GI (Gastro Intestinal) tract.

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

[AHS 1023] **OCTOBER 2023** **Sub. Code: 2411**

M.Sc. RADIOTHERAPY TECHNOLOGY
SECOND YEAR (From 2020-2021 onwards)
PAPER I – CLINICAL BIOLOGY, RADIATION TOXICITIES, STEREOTACTIC RADIOTHERAPY, RADIOSURGERY, SBRT RADIOTHERAPY

Q.P Code: 282411

Time: Three hours **Maximum: 100 Marks**

Answer ALL Questions

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

1. Discuss Quality Assurance in SRS, SRT and SBRT.
2. Explain all the 6Rs of Radiobiology.

II. Write notes on: **(10 x 6 = 60)**

1. Direct and indirect action of radiation.
2. Biological Equivalent Dose (BED).
3. Radiobiology of hypo fractionation.
4. Radio sensitivity.
5. Late radiation toxicities of skin.
6. Early reacting tissues.
7. Radiation carcinogenesis.
8. SRS using gamma knife.
9. Discuss oxygen effect.
10. NTCP (Normal Tissue Complication Probability).

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

[AHS 1024] **OCTOBER 2024** **Sub. Code: 2411**

M.Sc. RADIOTHERAPHY TECHNOLOGY
SECOND YEAR (From 2020-2021 onwards)
PAPER I – CLINICAL BIOLOGY, RADIATION TOXICITIES, STEREOTACTIC RADIOTHERAPY, RADIOSURGERY, SBRT RADIOTHERAPY

Q.P Code: 282411

Time: Three hours **Maximum: 100 Marks**

Answer ALL Questions

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

1. Cell survival curve. Describe the Linear Quadratic model.

2. Discuss Stereotactic Body Radiotherapy (SBRT).

II. Write notes on: **(10 x 6 = 60)**

1. Radiation effects.
2. 5Rs in Radiotherapy.
3. BED.
4. Hyperfractionation.
5. OER.
6. Liner Energy Transfer.
7. Early effects on normal tissue.
8. Management of oral mucositis.
9. Effect of Radiation on Skin.
10. Mean Lethal Dose.

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

[AHS 1025] **OCTOBER 2025** **Sub. Code: 2411**

M.Sc. RADIOTHERAPY TECHNOLOGY
SECOND YEAR (From 2020-2021 onwards)
PAPER I – CLINICAL BIOLOGY, RADIATION TOXICITIES, STEREOTACTIC RADIOTHERAPY, RADIOSURGERY, SBRT RADIOTHERAPY

Q.P Code: 282411

Time: Three hours **Maximum: 100 Marks**

Answer ALL Questions

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

1. Explain the principles, planning considerations and clinical indications of SBRT in lung cancers.

2. Explain interaction of Radiation with matter with diagrams.

II. Write notes on: **(10 x 6 = 60)**

1. Role of radiosensitizers in modifying radiation response.
2. Explain Neurocognitive decline after cranial irradiation.
3. Explain Sublethal and potentially lethal damage repair.
4. Discuss the effects of fraction size on normal tissues and tumours in radiobiology.
5. What is shutter error? How will you measure and correct it?
6. Write occupational dose limits in detail.
7. Explain beta ray applicators.
8. Write note on thermal and fast neutrons and explain its similarities.
9. Explain LINAC with diagram.
10. Describe and compare Ir 192 and cobalt 60 HDR brachytherapy sources.

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