

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

**[AHS 0122]**

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

**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. 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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