

QP Code: 101117

Reg. No.:.....

**PG Degree Supplementary Examinations in Radiation Oncology
(MD) April 2026**

Paper I – Radiation Physics, Radiobiology & Other Basic Sciences

Time: 3 hrs

Max marks:100

- *Answer all questions to the point neatly and legibly • Do not leave any blank pages between answers • Indicate the question number correctly for the answer in the margin space*
- *Answer all parts of a single question together • Leave sufficient space between answers*
- *Draw table/diagrams/flow charts wherever necessary*

Essay: (20)

1. Describe radiobiological principles of fractionation. Explain α/β ratio and its clinical implications.

Short essays: (8x10=80)

2. Explain ALARA principle. Discuss deterministic vs stochastic effects. (4+6)
3. Describe flattening filter free beams. Mention advantages and disadvantages. (6+4)
4. Explain working principle of TLD. Discuss its applications in radiotherapy. (6+4)
5. Define tissue phantom ratio (TPR). Differentiate PDD and TPR. (4+6)
6. Define LET and RBE. Discuss their clinical significance. (4+6)
7. Define dose volume histogram (DVH). Discuss its clinical interpretation. (4+6)
8. Define geometric penumbra. Discuss factors influencing penumbra. (5+5)
9. A patient with carcinoma cervix is planned for HDR intracavitary brachytherapy.
 - a) Describe physical properties of Iridium-192 source.
 - b) Discuss dose rate differences between LDR and HDR. (5+5)
