

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

[AHS 0321]

MARCH 2021

Sub. Code: 4017

(OCTOBER 2020 EXAM SESSION)

M.Sc. MEDICAL PHYSICS

FIRST YEAR (From 2010-2011 onwards)

PAPER VII – PHYSICS OF RADIATION THERAPY

Q.P. Code : 284017

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate notes on:

(2 x 20 = 40)

1. Write a detailed note on kilovoltage therapy and its various sub-categories. List the merits and demerits of each range.
2. Explain in detail the formalism to determine the reference air kerma rate (RAKR) for brachytherapy source calibration.

II. Write Short Notes on:

(10x6 = 60)

1. Explain the role of klystron. How is its function different from that of the magnetron?
2. Construction and working of a Pneumatic shutter system.
3. Merits and demerits of manual and remote afterloading techniques in brachytherapy.
4. Explain the principle and working of a simulator.
5. Give the role of dose calculation algorithms in RT and mention about the different types of algorithms used in treatment planning systems.
6. Quality assurance of a high dose rate (HDR) brachytherapy unit.
7. Multi-leaf collimators and their role in modern radiotherapy
8. Illustrate with diagram the principle, functioning and drawbacks of a travelling waveguide.
9. Explain how the XYZ co-ordinate system method is used for isocenter set-up.
10. What is the planning target volume (PTV)? Explain the factors contributing to PTV margin.
