

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

[AHS 0921]

**SEPTEMBER 2021  
(MAY 2021 EXAM SESSION)**

**Sub. Code: 4017**

**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. What are the advantages of the proton beam over the photon beam? Describe the principle, construction and working of a Proton synchrotron with a neat schematic.
2. Describe in detail classification of brachytherapy based on application technique and highlight their clinical uses.

**II. Write Short Notes on:**

**(10x6 = 60)**

1. How does the magnetron work in a linear accelerator? List its limitations.
2. Construction and working of a Mercury shutter system.
3. List the ideal characteristics of a brachytherapy source.
4. Depth dose characteristics of a clinical electron beam.
5. Write briefly about the Pencil beam algorithm and list its advantages and disadvantages.
6. Manchester system for dose calculation in brachytherapy.
7. Explain the build-up region based on charged particle equilibrium.
8. Integrated brachytherapy unit.
9. Define tissue maximum ratio (TMR) and percentage depth dose (PDD) and derive the relationship between them.
10. Explain the role of the wedge filter and its different types.

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