[LA0512] **Sub: Code: 4014**

M.Sc(MEDICAL PHYSICS)DEGREE EXAMINATION-MAY 2012

FIRST YEAR

RADIATION DOSIMETRY AND STANDARDIZATION

Q.P.Code: 284014

Time: 3 hours **Maximum: 100 Marks**

180(Min) **Answer All Questions**

I. Elaborate on:

	pages (Max)	Time (Max)	Marks (Max)
1. a. Explain the terms "primary standard and Secondary Standard". Describe with neat diagram how exposure is measured using Free Air Ionization Chamber b. Explain how the Ir^{192} source is standardized using Well type Ionization Chamber. Explain different correction factors involved in this procedure.	17	40	20
2. a. Explain in detail how neutrons of different energies interact with tissue b. Discuss in detail the Manganese Sulphate bath method for primary standardization of Neutrons.	17	40	20

II. Write short notes on:

1. Define particle Fluence and Energy Fluence. Give their symbols and units.	4	10	6
2. Explain two different types of dead time. Give formula for both.	4	10	6
3. How neutrons are classified? Discuss the energy distribution of			

Thermal Neutrons.	4	10	6
4. Write a short notes reactor and cyclotron produced radioisotopes.	4	10	6
5. Define the following and give its unit (a) Mass Attenuation Coefficient (b) Mass Stopping Power(c) Linear Energy Transfer.	4	10	6
6. Explain in brief “Bragg-Gray and Burlin Cavity” theories.	4	10	6
7. Explain the principle Ceric and Cerous dosimeters.	4	10	6
8. A 1 mCi point Co^{60} source is immersed in a unit density uniform water medium. Calculate the primary component of water- KERMA Rate/ mCi at 1 cm from the source in units of cGy/hr/mCi. The values of mean mass energy absorption coefficient and mass attenuation coefficient of water at Co^{60} Energy are 2.965×10^{-2} cm^2/gm and $6.323 \times 10^2/gm$ respectively.	4	10	6
9. Compare the characteristics of proportional, GM and scintillation counters.	4	10	6
10. Distinguish between TRS-277 and TRS-398.	4	10	6

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