

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

[LR 1220]

**DECEMBER 2020
(AUGUST 2020 EXAM SESSION)**

Sub. Code: 1938

**BACHELOR IN RADIOTHERAPY TECHNOLOGY
THIRD YEAR**

(New Syllabus 2014-2015)

**PAPER III – QUALITY ASSURANCE, RADIOBIOLOGY & RADIATION SAFETY
IN RADIOTHERAPY**

Q.P. Code: 801938

Time: Three Hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. a) Explain the various components of cobalt – 60 Teletherapy machine.
b) Describe in detail about the quality assurance of HDR Brachytherapy unit.
2. Discuss in detail about the radiation survey in the following Radiotherapy equipments with diagram.
a) Linear Accelerator b) Telecobalt c) HDR Brachytherapy.
3. a) Define chromosomal aberrations and its different types.
b) Describe the relationship between linear energy transfer LET and oxygen enhancement ratio OER.

II. Write notes on:

(8 x 5 = 40)

1. Define stochastic effects.
2. Explain the Regularity requirement procedure in procurement of Brachytherapy source.
3. Output calibration of Linear accelerator.
4. Explain the significance of Laser in patient setup and necessary quality assurance.
5. Role of Radiotherapy technician in handling radiation emergencies.
6. Radiation weighting factors of ionizing radiation.
7. Time, dose, Fractionation relationship.
8. Relationship between Kerma and absorbed dose.

III. Short answers on:

(10 x 3 = 30)

1. Front pointer and back pointer.
2. Beam ON-OFF mechanism.
3. RHM and RMM.
4. What are the steps to be taken if a radiation worker is said to be overexposed?
5. What are Free radicals?
6. Draw the flow chart diagram of TLD reader for dose estimation.
7. Explain swipe test.
8. Define Risk models.
9. What are the different types of meters used for radiation survey and Area monitoring?
10. Define Tenth Value Layer. What is the TVL values of concrete for cobalt -60 and Cs¹³⁷?
