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

[AHS 0424] **APRIL 2024** **Sub. Code: 1938**

B.Sc. RADIOTHERAPY TECHNOLOGY
THIRD YEAR – (Regulations 2014-2015 & 2018-2019 onwards)
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. Direct and Indirect Biological effects of Radiation and the characteristics of Oxygen effects during Radiation Therapy.
2. a) Principles of Radiation protection.
   b) Responsibilities of Licensee and Radiation Safety Officer (RSO).
3. Different QA tests performed in the Brachytherapy unit.

II. Write notes on: **(8 x 5 = 40)**

1. Dose limits set by AERB and ICRP for Radiation workers and the General Public.
2. Optical and Field congruence test.
3. Primary and Secondary barriers and last man out switch.
4. Role of Time, Dose and Fractionation in Radiation therapy.
5. Relationship between KERMA and Absorbed dose.
6. Working principle of Thermoluminescence dosimeter with neat diagram.
7. Requirement of AERB in procurement of Teletherapy source.
8. Relationship between Linear Energy Transfer (LET), Oxygen Enhancement Ratio (OER) and Relative Biological Effect (RBE).

III. Short answers on: **(10 x 3 = 30)**

1. Front and Back Pointer.
2. Free Radicals.
3. Beam shaping jaws.
4. Stochastic and Deterministic effect.
5. ALARA.
6. Thimble chamber.
7. Hyperthermia.
8. Leakage and Scattered Radiation.
9. Contamination monitor.
10. Equivalent and Effective dose.

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