

B.Sc. RADIOTHERAPY TECHNOLOGY
(New Syllabus 2014 - 2015)

THIRD YEAR

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

Q.P. Code: 801938

Time: Three Hours

Maximum: 100 Marks

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. Describe in detail about the mechanical and radiation quality assurance (QA) procedures of medical linear accelerator.
2. Explain the principle and working of TLD badge as a personnel monitoring device with a neat diagram.
3. (a) Define chromosomal aberration. Explain different types of chromosomal aberration.
(b) Describe stochastic and non-stochastic effects of radiation.

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

1. Relationship between linear energy transfer (LET) and oxygen enhancement ratio (OER).
2. Significance of time, distance and shielding in radiation safety.
3. Explain free air ionization chamber with neat diagram.
4. Classification of brachytherapy based on dose rates.
5. Direct and indirect effects of ionizing radiation.
6. Merits and demerits of film badge.
7. Responsibilities of radiation safety officer (RSO).
8. List the important quality assurance test to be performed weekly and monthly in a telecobalt unit.

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

1. Relative biological effectiveness (RBE).
2. LD_{50/60}.
3. Effective dose.
4. Fluence and its unit.
5. Somatic effect.
6. Annual effective dose limits of occupational worker and member of public as per ICRP and AERB.
7. Gamma zone monitor.
8. What is hyperthermia?
9. What are primary and secondary barriers?
10. What is swipe test?
