

**Post M.Sc Diploma in Radiological Physics Regular/Supplementary  
Examinations October 2021**

**Radiation Safety**

Time: 3 hours

Max. Marks: 100

- *Answer all questions to the point neatly and legibly • Do not leave any blank pages between answers • Indicate the question number correctly for the answer in the margin space*
- *Answer all parts of a single question together • Leave sufficient space between answers*
- *Draw table/diagrams/flow charts wherever necessary*
- *Use of Calculators/physical and mathematical tables permitted.*

**Essay:****(2x14=28)**

1. What are the emergency procedures in case of source failure in high dose rate brachytherapy. Write a neat sketch of high dose brachytherapy facility having approval for Ir-192 source.  
Calculate the barrier transmission factor in 15 MV linear accelerator room for the work load 10000cGy/week. The maximum permissible dose at outside primary wall should not exceed 1mSv/week. The primary wall is at 3 meters distance from isocentre. Given values for use factor =1 and occupancy factor =1. (9+5)
2. What are the advantages of remote after loader compared with manual brachy in radiation safety point of view. Write short notes on electronic brachytherapy and its advantages. (9+5)

**Short Essays****(4x8=32)**

3. Define radiation and tissue weighting factors and equivalent dose.
4. Draw a neat diagram of nuclear medicine facility having gamma camera and PET-CT
5. What are the basic principles of Radiation Protection. Mention the radiation exposure limits set by AERB for radiation worker and public
6. List few documents required to dispose radioactive waste. Explain different packages and labels used in transport

**Short Notes****(10x4=40)**

7. Define committed equivalent and effective dose.
8. Explain occupational exposures.
9. Area monitoring.
10. Explain internal radiation hazards.
11. Give four examples of protective equipment in radiology.
12. Explain few points on radiation safety during source transfer
13. What are the general packing requirements to transport radioactive material.
14. Explain regulations to transport different modes of transport.
15. What are carrier responsibilities in transport of radioisotopes.
16. List few points on responsibilities of employer in hospitals.

\*\*\*\*\*