

QP Code: 106391

Reg. No.....

**Post M.Sc Diploma in Radiological Physics Regular/Supplementary
Examinations October 2022**

Radiation Detectors and Instrumentation

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*
- *Use of Calculators/physical and mathematical tables permitted.*

Essay:

(2x14=28)

1. • Explain the characteristic curve of a gas filled detector and the working of proportional counter with diagrams.
• For a detector of cylindrical geometry of an outer diameter of 1.5cm and applied voltage of 600 V, find the electric field near the anode at a distance of i) 0.01 cm and ii) 0.1cm (the diameter of the anode is 1mm) (9+5)
2. Explain the working of TLD, OSLD and RPL. Explain how TLD is calibrated and used for dosimetry.

Short Essays

(4x8=32)

3. Principle of MOSFET and its application
4. What is the dead time of GM detector and explain why it happens. Explain resolving time and recovery time.
5. Gamma ray spectrometers and multichannel analyser
6. Principle of calorimetry

Short Notes

(10x4=40)

7. Contamination monitors
8. Gamma area alarm monitors
9. Farmer dosimeters
10. Radiation field analyser
11. Pocket dosimeters
12. Dosimeters in brachytherapy
13. Calibration of dosimeters
14. Guard ring and stem effect
15. MOSFET Electrometer
16. Extrapolation chamber
