

QP Code: 107391

Reg. No.....

**Post M.Sc Diploma in Radiological Physics Regular/Supplementary
Examinations November 2020**

Radiation Therapy

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. Explain the different steps involved in the output calibration of high energy X-rays of a Linear accelerator using IAEA TRS 398 protocol. List the various correction factors used. What for we do apply the correction factors. An ion chamber used to calibrate a linear accelerator was calibrated at 22°C and 1013.2mbar. what would be the temperature and pressure correction factor need to be applied to the chamber reading if the average pressure and temperature at the time of output measurement were 1008.9 mbar and 24.5°C. (10+4)
2. Briefly describe the physical characteristics of any four radionuclides used in Brachytherapy. Explain the Manchester system of dose specification in the treatment of uterine cervix. An Ir-192 source with an initial activity of 10 Ci was replaced after 180 days by a new source with 9.89Ci activity. What would be the total dwell time of an intracavitary treatment with the new source if the total dwell time is 590sec with old source on that day.

Short Essays

(4x8=32)

3. What are isodose curves. What are the factors that affect the electron isodose curves.
4. What are the beam modifiers used in teletherapy. Briefly explain each.
5. What are the advantages of megavoltage photon beams in radiotherapy. Explain the variation of photon depth dose for various energies.
6. Briefly explain the various Quality assurance tests that are to be carried out periodically in a cobalt 60 machine as per AERB protocol.

Short Notes

(10x4=40)

7. IMRT
8. Gamma Knife
9. Motorized wedge
10. TAR
11. Klystron
12. Radiotherapy simulator
13. Integral dose
14. Inverse planning Algorithms in treatment planning
15. Tissue compensators
16. TSET
