RADIOTHERAPY

PAPER – IV

RTH/D/16/41/IV

Time : 3 hours
Max. Marks : 100

Important instructions:

- *Attempt all questions in order.*
- *Each question carries 10 marks.*
- *Read the question carefully and answer to the point neatly and legibly.*
- *Do not leave any blank pages between two answers.*
- *Indicate the question number correctly for the answer in the margin space.*
- *Answer all the parts of a single question together.*
- *Start the answer to a question on a fresh page or leave adequate space between two answers.*
- *Draw table/diagrams/flowcharts wherever appropriate.*

Write short notes on:

1. a) Low Dose Rate (LDR) and High Dose Rate (HDR) brachytherapy techniques of carcinoma prostate with radiobiological principles. 5+3+2
   b) The properties of radioisotopes used in LDR and HDR.
   c) Late complications of both the techniques.

2. a) Define and explain the principle of Stereotactic Radiation. 2+4+2+2
   b) Mention the differences between Stereotactic Radiosurgery (SRS) and Stereotactic Radiotherapy (SRT)
   c) What are the tolerance doses of optic chiasm and brainstem for SRS and SRT brain stem?
   d) Radiobiological concept of SRS for Arteriovenous Malformation (AVM).

3. a) Role of MRI imaging in radiotherapy treatment planning 5+5
   b) Role of PET CT in radiotherapy treatment planning

4. a) Name the essential tools of plan evaluation. 3+3+4
   b) Explain why one of the methods alone is not sufficient, with suitable example.
   c) ICRU-83

5. a) Name the three interactions of X-rays with matter. 3+4+3
   b) What is Compton Effect?
   c) Why Compton Effect is preferred in radiotherapy and not in radiodiagnosis?

6. Radioactive isotope ablation therapy for Papillary carcinoma of thyroid in a post operative setting with regards to: 2X5
   i) Indications
   ii) Isotopes used
   iii) Pre procedure precautions
   iv) Post procedure instructions
   v) Follow up and surveillance

P.T.O.

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7. a) Polymerase Chain Reaction (PCR): Principles & procedure. 5+2+3
   b) Mention the types of PCR.
   c) List its advantages and limitations.

8. a) What are the various fractionation schedules in radiotherapy? 5+5
   b) Explain the radiobiological basis for each of them.

9. a) Prognostic and Predictive markers. 5+5
   b) Use of CEA and CA-125 as prognostic and predictive markers.

10 a) Indications of radiotherapy for pancreatic cancer. 3+7
   b) Intensity Modulated Radiotherapy (IMRT) technique for carcinoma pancreas – volume delineation, dose, Organs at Risk (OAR) and dose constraints.