

RADIOTHERAPY**PAPER-IV**Time: 3 hours
Max. Marks:100

RTH/J/20/41/IV

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) Major interactions of ionizing radiation with matter. 5+5
b) Cellular and molecular basis of radiation damage.
2. a) Linear energy transfer. 2+3+2+3
b) Stochastic and deterministic effects of radiation.
c) Deep inspiration breath hold technique.
d) 2-D matching of photon-photon and photon electron fields.
3. a) Discuss the 4 Rs of Radiobiology. 6+2+2
b) Abscopal Effect.
c) Radiotherapy & Immunotherapy.
4. a) Hyperthermia and Radiation. 6+4
b) What is thermal dose equivalent?
5. Clinical relevance of liquid biopsy in malignant tumours – mechanism, 3+3+4
indications and its role in monitoring disease.
6. a) I^{125} . 3+3+4
b) OER and LET.
c) Vaccines in cancer.
7. a) 18 F-PSMA PET/CT. 5+5
b) 68Ga-DOTATOC.
8. a) Fraction size and overall treatment time. 5+5
b) Clinical application of IORT in breast cancer.
9. a) QUANTEC values of structures of the eye ball. 5+5
b) Design of a Gamma knife.
10. Rationale and indications for using radio-immunoglobulins in malignant 10
disease.
