

RADIOTHERAPY

PAPER – IV

RTH/J/17/41/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) Explain a cell survival curve with a suitable diagram. 5+5
b) Explain how the curves are different for low and high LET radiations.
2. a) What is oxygen enhancement ratio? 4+6
b) Explain the importance of oxygenation during fractionated radiation using photons and neutrons.
3. A patient with a T₃N₁ tonsillar SCC was to be treated with 70 Gy in 35 fractions over 7 weeks, 5 days a week. The treatment was interrupted after 5 completed weeks (50 Gy) for 1 week, to allow healing of mucositis. 5+5
a) If the remaining 20 Gy is given over the next two weeks, what is the predicted loss in tumour control probability? Explain your calculations and radiobiological basis.
b) What strategy can you adopt to complete the proposed treatment in a total treatment time of 7 weeks? Explain why you do not anticipate worse tumour control or late morbidity?
4. a) What are the various dosimetric systems used for interstitial brachytherapy? 2+(5+3)
b) What are the rules of Paris Technique? Draw neat diagrams to explain the rules.
5. a) What is maximum permissible dose? 3+(5+2)
b) What are the recommendations for this? Explain ALARA principle.
6. a) What are the radiological investigations recommended by FIGO for carcinoma cervix and why? 2+2+3+3
b) What is the use of CT scan and MRI in this disease?

P.T.O.

RADIOTHERAPY

PAPER – IV

7. a) Enumerate the laboratory and radiological investigations required for the staging of multiple myeloma. 4+6
b) Give details of the likely abnormalities that may be detected and how they determine the stage of disease?
8. Anti-angiogenic agents have been used successfully and unsuccessfully in the management of cancers. 3+3+2+2
a) Name the target/pathway used for anti angiogenic agents. Name the generic drugs.
b) Dose limiting toxicities of such agents.
c) One clinical site where it has succeeded – describe how integrated with treatment.
d) One clinical site where it was not succeeded – describe how integrated with overall treatment.
9. a) What is the principle of flow cytometry? 3+(4+3)
b) How is it useful in diagnosis of malignancy? Give examples.
10. a) When is an intrafractional motion management strategy utilized when treating with radiation therapy? 2+2+3+3
b) What sites, in the human body, may require such strategies?
c) What are the broad categories of motion management from a technical perspective?
d) Explain in a schematic diagram, any one site and a related commercially available motion management strategy of your choice.
