RADIOTHERAPY

PAPER – I

RTH/J/15/41/I

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) Relevance of the anatomical components in the planning of radiotherapy to the breast. b) Radiotherapy techniques relevant in the planning for a post left sided breast conservation radiotherapy for a 35 year old lady with Carcinoma breast $T_2N_1M_0$.		5+5
2.	a) Define 3D conformal Radiotherapy. What are the advantages of 3D conformal Radiotherapy over 2 dimensional planning? b) In 3D CRT, enumerate the steps of Plan Implementation. c) What Quality Assurance Checks are used to confirm the validity and accuracy of a 3D CRT Plan?		3+4+3
3.	a) Define IGRT (Image Guided Radiotherapy) and specify the requirements for an ideal image guidance system in radiotherapy. b) Clinical applications of IGRT in current practice.		5+5
4.	a) Isotopes for high dose rate brachytherapy in current practice with advantages and disadvantages of each. b) Role of brachytherapy in: i. Carcinoma oropharynx ii. Carcinoma anal canal		6+(2+2)
5.	a) Physical properties of electron beams. b) Clinical applications of electron beams.		5+5
6.	a) Various imaging modalities used in the screening for cancer breast. b) Statistical tests used in the analysis of effectiveness of a screening test.		5+5

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7.	a) Various devices used for radiation monitoring. b) Rationale, structure, advantages and disadvantages of any one personnel monitoring device.		4+6
8.	a) Structure and function of a proton beam accelerator. b) Physical characteristics of a proton beam and the current clinical applications of proton beams.		4+(3+3)
9.	a) How will you design a Phase III Clinical Trial in Oncology? b) Define interim analysis, definitive analysis and secondary analysis. c) Current guidelines for reporting Randomized Clinical Trials in Radiation Oncology.		4+3+3
10.	It is proposed to install a linear accelerator in a Radiotherapy Department equipped only with cobalt 60 units. a) What should be the optimum energy of this unit? Give your reasons. b) What are the quality assurance checks that should be carried out before the accelerator is introduced for clinical use? c) What would be the advantages/disadvantages of very high energy beam (50 MV/100 MV) in Teletherapy?		4+3+3

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