M.Sc (MEDICAL PHYSICS) DEGREE EXAMINATION- MAY 2012
FIRST YEAR
Paper VII – PHYSICS OF RADIATION THERAPY
Q.P. Code: 284017

Time: Three hours   **Maximum: 100marks**
     180 (Min)   **Answer All questions.**

I.   **Elaborate on :**

	Pages (Max)	Time (Max)	Marks (Max)
1. Explain the detail the design and working of a medical linear accelerator.	17	40	20
2. Describe the acceptance, commissioning and quality assurance protocol for installing a remote after loading equipment.	17	40	20

II.   **Write notes on:**

	Pages	Time	Marks
1. Drive the relationship between Tissue Maximum Radio and Percentage Depth Dose.	4	10	6
2. How a integrated brachytherapy facility works. Give the sequence of procedures that is followed in such facilities.	4	10	6
3. Describe the construction of travelling and standing wave guides.	4	10	6
4. Describe the construction and working of a Van De Graff generator.	4	10	6
5. A patient has to receive 250cGy by rotation therapy using 4 MV X-rays. The field size is 6x10 sq.cm. at the isocenter which is at 100cms. The average TMR is 0.756, Machine output is 200 MU/min, collimator scatter factor for the given field size is 0.98 and phantom scatter is 0.99. Find the number of monitoring units required to deliver the treatment.	4	10	6
6. Explain the how the skin sparing effect is achieved by the high energy photon beams.	4	10	6
7. Describe the dose and volume specification for reporting gynecological treatments using ICRU 38 protocol.	4	10	6
8. Describe the setup for measuring the back scatter factor and peak scatter factor.	4	10	6
9. Describe the dose volume histograms and conformity indices used for studying the merits of a treatment plan.	4	10	6
10. Explain the Clarkson's method used for calculation the irregular treatment field.	4	10	6

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[LC 0413]   **APRIL 2013**   **Sub. Code: 4017**
M.Sc (MEDICAL PHYSICS) DEGREE EXAMINATION
(Revised Regulations for Candidates admitted from 2010-2011)
FIRST YEAR
Paper VII – PHYSICS OF RADIATION THERAPY
Q.P. Code : 284017

Time: Three hours   **Maximum :100marks**

I. Elaborate on: **(2x20=40)**

1. Describe the output calibration of high energy teletherapy Unit on the basis of IAEA TRS 398 protocol.
2. Describe the various beam modifying and shaping devices And its clinical importances.

II. Write notes on :   **(10X6=60)**

1. Describe the Virtual Simulations.

2. Describe the asymmetric collimations.

3. Describe the travelling and standing wave guide.

4. Describe the Field analyser.

5. Describe the Dynamic Wedges.

6. Explain the ICRU 50.

7. Describe the electron dosimetry.

8. Explain the neutron capture therapy.

9. Describe the significance of Percentage Depth dose And Tissue Maximum, ratio.

10. Describe the cyclotron.

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FIRST YEAR
PAPER VII – PHYSICS OF RADIATION THERAPY

Q.P. Code : 284017

Time : 3 hours   **Maximum : 100 marks**
Answer ALL questions

I. Elaborate on :   **(2X20=40)**

1. Describe the design and working of a Medical Electron linear accelerator.

2. Describe Low dose Rate (LDR), Medium Dose Rate (MDR), Pulsed Dose Rate (PDR) and High Dose Rate (HDR) in Brachytherapy. Compare HDR brachytherapy with LDR brachytherapy in detail. Describe the sources used in HDR and LDR remote after loading machines.

II. Write notes on: **(10X6=60)**

1. Describe a CT Simulator and explain Virtual Simulation
2. Explain in detail the Treatment time calculation method and the factors used for calculating the treatment time calculation for a cobalt unit.
3. What are isodose curves and explain the methods of obtaining the same. Compare an open beam isodose curve with a 30° wedge isodose curve for a 6 MV photon beam
4. Explain beam directional devices and patient setup devices. Compare SSD and SAD treatment setups
5. What are the plan evaluation techniques? Explain them in detail with examples
6. What is pseudo isocenter? What is planning isocenter and how are these used for patient setup?
7. How EPID is used for patient setup?
8. What is in-vivo dosimetry and how is it performed?
9. What is inverse planning? Write a note on Optimization in External beam therapy
10. Write a note on commissioning and quality assurance of a Treatment Planning system

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