B.Sc. in Radiation Therapy Technology (BRTT)

00285

Term-End Examination

December, 2012

BAHI-043 : RADIOBIOLOGY AND RADIATION PROTECTION

Time : 3 hours   *Maximum Marks : 70*

PART - A

Answer *any five* questions. Each question carries 8 marks.   8x5=40

1. What are the five R's of Radiobiology ? Explain them in detail.

2. Explain the Radiation effects at the cellular level. Explain single and double strand breaks.

3. Explain the fractionation and its effect with a cell survival curve.

4. Explain Linear Quadratic Model and discuss the alpha/beta ratio.

5. Define Genetic effect and somatic effects. Explain stochastic and deterministic effects and their relationship with dose.

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6. Explain the principles of Radiation Protection namely, Justification, Optimization and dose limits.

7. With help of a neat diagram explain the room design for a Telecobalt unit.

8. Mention three shielding materials used for radiation protection in Radiotherapy. Give the physical properties of these shielding materials.

PART - B

9. Write short notes on *any five* of the following. Each carries 6 marks. 6x5=30

    (a) Cell cycle and radio sensitivity.

    (b) Radiation effects on fetus.

    (c) Biological Modifiers.

    (d) The concept of ALARA.

    (e) Linear Energy Transfer and Radiobiological Effectiveness.

    (f) Tumor Control Probability (TCP) and Normal Tissue Complication Probability (NTCP).

    (g) Radiation weighting factors.

    (h) Radiation Protection in Manual Brachytherapy.

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