

[LB 0212]

AUGUST 2012

Sub. Code: 1902

B.Sc. RADIOTHERAPY TECHNOLOGY

FIRST YEAR

PAPER II – BASIC PHYSICS & RADIATION PHYSICS

Q.P. Code : 801902

Time : Three hours

Maximum : 100 marks

(180 Mins) Answer ALL questions in the same order.

I. Elaborate on:

**Pages Time Marks
(Max.)(Max.)(Max.)**

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|--|---|----|----|
| 1. Describe the diagnostic x-ray tube and explain the physics of production x-rays with neat diagram | 7 | 20 | 10 |
| 2. a. What is Radioactivity?
b. Explain the various methods of producing artificial radioactivity. | 7 | 20 | 10 |
| 3. What are the main modes of interaction of radiation with matter? Explain briefly about the mode of integration of radiation with matter which is useful in diagnostic area. | 7 | 20 | 10 |

II. Write notes on:

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|---|---|----|---|
| 1. Describe the electromagnetic radiation spectrum. | 4 | 10 | 5 |
| 2. a. State Ohm's law.
b. Derive the formula effective resistance when the resistors are connected in series and parallel. | 4 | 10 | 5 |
| 3. What is the law of electromagnetic induction? Describe the construction of Transformer. | 4 | 10 | 5 |
| 4. Explain how the alternation current is converted into direct current using Full wave rectifier. | 4 | 10 | 5 |
| 5. Derive the relationship between half life of an isotope and decay constant. | 4 | 10 | 5 |
| 6. What are the major components of nuclear reactor and explain how radioisotopes are produced in it. | 4 | 10 | 5 |
| 7. Define the following:
a. Roentgen
b. Absorbed Dose
c. Kerma | 4 | 10 | 5 |
| 8. Describe briefly about free air ionization chamber. | 4 | 10 | 5 |

III. Short Answers on:

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|---|---|---|---|
| 1. What is mass defect? | 2 | 4 | 3 |
| 2. What is eddy current? | 2 | 4 | 3 |
| 3. What are the properties of x-rays? | 2 | 4 | 3 |
| 4. What are the factors influencing the quality and | | | |

quantity of x-rays?	2	4	3
5. Draw neat diagram of half wave rectifier.	2	4	3
6. List out the various radioisotopes used in medicine.	2	4	3
7. Explain briefly about the process of Pair production.	2	4	3
8. What are the sources of radiation?	2	4	3
9. Describe the characteristic curve of ionization chamber.	2	4	3
10. Write a short note on Thermoluminescence Dosimeter.	2	4	3
