

[LB 0212]

AUGUST 2012

Sub. Code: 1402

**DIPLOMA IN RADIOLOGY IMAGING TECHNOLOGY**

**FIRST YEAR**

**PAPER II – GENERAL PHYSICS, RADIATION PHYSICS &  
PHYSICS OF DIAGNOSTIC RADIOLOGY**

*Q.P. Code : 841402*

**Time : Three hours**

**Maximum : 100 marks**

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

**I. Elaborate on:**

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

- |  |   |    |    |
|--|---|----|----|
| 1. What is the principle electromagnetic induction and explain its application in X- ray production? | 7 | 20 | 10 |
| 2. Describe in detail about the factors affecting the quality and quantity of X-rays.                | 7 | 20 | 10 |
| 3. What is the principle of radiation detection and explain about personnel monitoring.              | 7 | 20 | 10 |

**II. Write notes on:**

- |   |   |   |   |
|---|---|---|---|
| 1. Atoms and molecules.                               | 4 | 9 | 5 |
| 2. Filtration.  | 4 | 9 | 5 |
| 3. Mutual induction.                                  | 4 | 9 | 5 |
| 4. Anode assembly.                                    | 4 | 9 | 5 |
| 5. Compton effect.                                    | 4 | 9 | 5 |
| 6. Radiation zone monitor.                            | 4 | 9 | 5 |
| 7. Write about the phenomenon of thermionic emission. | 4 | 9 | 5 |
| 8. Half-value layer.                                  | 4 | 9 | 5 |
| 9. X-ray tube cooling.                                | 4 | 9 | 5 |
| 10. Binding energy.                                   | 4 | 9 | 5 |

**III. Short answers on:**

- |   |   |   |   |
|---|---|---|---|
| 1. Define current.  | 1 | 3 | 2 |
| 2. What is nucleus?   | 1 | 3 | 2 |
| 3. What is the commonly used target angle in diagnostic X-ray unit? | 1 | 3 | 2 |
| 4. Voltmeter and Ammeter.   | 1 | 3 | 2 |
| 5. Pocket dosimeter.  | 1 | 3 | 2 |
| 6. Why tungsten is used as target material in X-ray tube?           | 1 | 3 | 2 |
| 7. What is kVp and mA stand for in imaging technology?              | 1 | 3 | 2 |
| 8. What is heat units?  | 1 | 3 | 2 |
| 9. Give charge and mass of neutron.                                 | 1 | 3 | 2 |
| 10. Expand TLD.   | 1 | 3 | 2 |

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[LC 0212]

FEBRUARY 2013

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**Maximum : 100 marks**

**Answer ALL questions.**

**I. Elaborate on:**

**(3X10=30)**

1. Explain in detail about various components of X-ray tube.
2. Describe the different types of radioactivity.
3. Describe about Bohr's atomic model structure

**II. Write Notes on:**

**(10X5=50)**

1. Excitation.
2. Photo electric effect.
3. Explain inverse square law.
4. Pair production.
5. Element and compound.
6. X-ray circuit.
7. Factors influencing X-ray beam quality and quantity.
8. Tube Voltage.
9. Self induction.
10. Principle of line focus.

**III. Short Answers on:**

**(10X2=20)**

1. Mass number.
2. Define work.
3. What is conduction.
4. What is electric potential.
5. Melting point of X-ray target material and atomic number.
6. What is ohm.
7. Define power and give its unit.
8. What is the charge and mass of an electron?
9. Filament current.
10. What is radiation.

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DIAGNOSTIC RADIOLOGY**

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**Time : Three hours**

**Maximum : 100 marks**

**Answer All questions.**

**I. Elaborate on :**

**(3x10 = 30)**

1. Describe the construction and working of modern x-ray tube.
2. Explain in detail about the photoelectric effect of radiation.
3. Write in detail about construction and working of ionization chamber.

**II. Write short notes on:**

**( 10X5= 50)**

1. Write briefly about properties of X-ray.
2. Sub atomic particles.
3. Excitation
4. Tube current
5. Electromagnetic radiation
6. X-ray efficiency
7. Explain the phenomenon of magnetism
8. Radiation survey meter
9. Radioactive decay
10. Principle of line focus.

**III. Short answers on:**

**(10X2=20)**

1. Define Ohm's law
2. Einstein's formula
3. What is the SI unit of radioactivity
4. Voltmeter and Ammeter
5. What is nucleon
6. Define work
7. Name the target material commonly used in X-ray tube
8. Atomic number and mass number
9. Define energy
10. What is element.

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