[LB 0212] **AUGUST 2012** **Sub. Code: 2103**

B.Sc. NUCLEAR MEDICINE TECHNOLOGY

FIRST YEAR

PAPER III – BASIC PHYSICS AND NUCLEAR PHYSICS

Q.P. Code : 802103

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

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

I. Elaborate on:	**Pages (Max.)**	**Time (Max.)**	**Marks (Max.)**
1. Describe the mechanisms of radioactive decay. Compare the properties of alpha, beta and gamma rays.	7	20	10
2. Explain a) electric charge b) electric potential c) electric current.	7	20	10
3. Explain Photoelectric effect, Compton effect and Pair-Production process and discuss the relative importance of each at various photon energies.	7	20	10
II. Write notes on:			
1. Periodic Table.	4	10	5
2. Fluorescence and Phosphorescence.	4	10	5
3. Binding energy.	4	10	5
4. What is meant by isotopes? Give examples.	4	10	5
5. Physical, biological and effective half life.	4	10	5
6. Derive $N = N_o e^{(-\lambda t).}$	4	10	5
7. Direct current and alternating current.	4	10	5
8. Define with units a) Absorbed dose b) Effective dose c) Equivalent Dose.	4	10	5
III. Short Answers on:			
1. Radiation.	2	4	3
2. Atom.	2	4	3
3. Difference between X-rays and Gamma rays.	2	4	3
4. Define Becquerel and Curie.	2	4	3
5. Joule's law.	2	4	3
6. Linear attenuation coefficient.	2	4	3
7. What will be the activity of a radioactive substance after 3 half lives if the initial activity is 120 Ci.	2	4	3
8. Isomeric Transition.	2	4	3
9. Ohm's law.	2	4	3
10. Voltmeter.	2	4	3

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