

[LB 0212]

AUGUST 2012

Sub. Code: 2111

B.Sc. NUCLEAR MEDICINE TECHNOLOGY

SECOND YEAR

PAPER I – PHYSICS OF NUCLEAR MEDICINE INSTRUMENTATION

Q.P. Code : 802111

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 an uptake probe and explain it's working with respect to I131 uptake studies. | 7 | 20 | 10 |
| 2. Describe the energy resolution of Gamma spectroscopy system. | 7 | 20 | 10 |
| 3. Describe the basic principle of rectilinear scanner and focused collimator for scanning. | 7 | 20 | 10 |

II. Write notes on:

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|--|---|----|---|
| 1. Describe the quality control tests for a Gamma camera – flood field uniformity, total system uniformity. | 4 | 10 | 5 |
| 2. Explain briefly multicrystal camera. | 4 | 10 | 5 |
| 3. Explain briefly liquid scintillation detectors. | 4 | 10 | 5 |
| 4. Define Auger electron its relationship atomic number and its energy. | 4 | 10 | 5 |
| 5. Explain briefly calibration of a spectrometer. | 4 | 10 | 5 |
| 6. Explain the ionization chamber and GM counter and their uses in nuclear medicine. | 4 | 10 | 5 |
| 7. Define Compton scattering. Explain its mechanism and significance in nuclear medicine and how to suppress them. | 4 | 10 | 5 |
| 8. Describe the principle of Geiger Muller survey meter its uses, and its limitations. | 4 | 10 | 5 |

III. Short answers on:

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|---|---|----|---|
| 1. Define hand held Gamma probe and material used for the probe. | 4 | 10 | 5 |
| 2. Describe Gray scale display. | 4 | 10 | 5 |
| 3. Define dead time, paralysable and non-paralysable systems. | 4 | 10 | 5 |
| 4. Define Roentgen, Gray, and L.E.T. | 4 | 10 | 5 |
| 5. Describe the coincidence detection. | 4 | 10 | 5 |
| 6. Explain septal thickness of collimator with respect to resolution. | 4 | 10 | 5 |
| 7. Describe the Chi square test with respect to P value. | 4 | 10 | 5 |
| 8. Describe briefly the dot factor in imaging of radioactivity. | 4 | 10 | 5 |
| 9. Describe collimator focus. | 4 | 10 | 5 |
| 10. Explain briefly rate meter-time constant. | 4 | 10 | 5 |
