

NUCLEAR MEDICINE
PAPER - IV

NM/D/13/24/IV

Time : 3 hours
Max. Marks : 100

Important instructions:

- Attempt all questions in order.
- Each question carries 10 marks.
- Read the question carefully and answer to the point neatly and legibly.
- Do not leave any blank pages between two answers.
- Indicate the question number correctly for the answer in the margin space.
- Answer all the parts of a single question together.
- Start the answer to a question on a fresh page or leave adequate space between two answers.
- Draw table/diagrams/flowcharts wherever appropriate.

1. Describe in detail the anatomy of thyroid gland with illustrations. 10
2. a) Receiver operator curves (ROC) 5+5
b) Gaussian and Poisson distribution
3. What is a scintillation detector? Enumerate characteristics of various scintillation detectors used in PET scanners with their merits and demerits. 2+8
4. Principle and applications of: 5+5
a) PEM (Position Emission Mammography)
b) CZT (Cadmium Zinc Tellurite)
5. QC procedures performed on SPECT camera in day to day practice and during periodic maintenance. 10
6. a) Describe various PET-MRI systems available with merits and demerits of each. 6+4
b) Advantages and Limitations of PET-MRI in oncological practice.
7. a) Filtered Back Projection. 5+5
b) Iterative Reconstruction Algorithms.
8. Enumerate various Radiation Monitoring devices. Describe the working principle, design and utility of TLD and Pocket dosimeter. 2+8
9. a) What is transport index? How are the different packages categorized based on this. 3+7
b) Classify radio-active waste. Mention various methods of waste disposal with the acceptable limits.
10. a) Quenching in liquid scintillation counting. 5+5
b) SPM and its applications in Nuclear Medicine.