

**NUCLEAR MEDICINE**

**PAPER-I**

Time: 3 hours  
Max. Marks:100

NM/J/19/24/I

**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.

**Write short notes on:**

1. Describe in brief various quality control parameters of Gamma Camera. 10
2. Latest ICRP recommendation of dose limits for professionals and general public. What are the significant changes over previous version? (4+4)+2
3. Describe radioactivity decay schemes with the help of diagram: 5+5
  - a) Fluorine-18
  - b) Gallium-68
4.
  - a) Various methods of image reconstructions in PET/CT. 5+5
  - b) Compare and contrast filtered back projection and other iterative methods of image reconstruction.
5.
  - a) Enumerate the filters used in SPECT images reconstruction and describe one in detail. 5+5
  - b) Name various collimators used in gamma camera imaging. Describe one in detail.
6.
  - a) Student's t test and chi square test. 5+5
  - b) Mean, median, mode and standard deviation.
7.
  - a) Half Value Layer and Tenth Value layer. (2+2)+(2+2+2)
  - b) Physical Half Life, Biological Half Life and Effective Half Life.
8.
  - a) Attenuation correction in PET/MRI 5+5
  - b) Describe in brief various Quality control parameters in PET/CT.
9.
  - a) Derive decay equation from the Radioactivity Decay Law. 5+5
  - b) Pocket dosimeter: principle, its advantages and disadvantages.
10. Define radiation interaction with matter. Describe any two in detail. 2+(4+4)

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