Write short notes on:

1. Significance of collimation, type of collimators and applications in Nuclear Medicine procedures. 10

2. Transportation of Radio-isotope: Regulatory clearances required, various packages and importance of transport index. 10

3. List advantages of image archiving and communication systems & utility in Nuclear Medicine. 10

4. a) Attenuation correction. 5X2
   b) Scatter correction.

5. Describe routine quality control procedures of a gamma camera and describe expected results in each case. 10


7. Interaction of radiation with matter. Mention example of each. 10

8. Importance of radio-protectors and radio-sensitizers with example. Elaborate upon mechanism of action and their application. 10

9. a) TLD 2x5
   b) ICRP-recent recommendations

10. Describe basis of in vitro Nuclear Medicine procedures in current practice. 10
Time : 3 hours
Max. Marks : 100

Attempt all questions in order.
Each question carries 10 marks.

Write short notes on:

1. Significance of Non-FDG radiopharmaceuticals, current status and utility with examples. 10
2. a) $^{99m}Tc$ breakthrough
   b) Equilibrium 5X2
3. Discuss the use of Jaszczak phantom in evaluating system performance. 10
4. Recent advances in radionuclide therapy. 10
5. Application of an intra-operative probe in Nuclear Medicine with examples elaborated. 10
6. a) $^{14}C$ Breath Test – basis and applications.
   b) Dose response curve and its significance. 5x2
7. How would you assess the dose delivered to any organ after administration of a specific radionuclide? 10
8. Enumerate the properties of an ideal diagnostic radio pharmaceutical. What are the mechanisms of localization? 10
9. List various isotopes & techniques used in emergency situation, elaborate upon one. 10
10. a) Nuclear Medicine in evaluation of GB function.
    b) Thallium 201 & its use in Nuclear Medicine. 5x2

POSSESSION / USE OF CELL PHONES OR ANY SUCH ELECTRONIC GADGETS IS NOT PERMITTED INSIDE THE EXAMINATION HALL.
Write short notes on:

1. PET & SPECT imaging in differential diagnosis of dementia. 10
2. a) Redifferentiation therapy – approaches and agents. 5x2
   b) Thyroiditis
3. a) Prognostication using PET-CT technology. 5x2
   b) Metabolic biopsy: its basis and applications.
4. a) Bone scan in benign bone disorders. 5x2
   b) Nuclear Medicine procedures in evaluation of drug abuse.
5. Algorithmic evaluation of solitary thyroid nodule and management detail. 10
6. Role of nuclear medicine in evaluation and management of NET in elaboration. 10
7. a) Lympho scintigraphy or sentinel lymph node imaging. 5x2
   b) Evaluation of CSF leak.
8. Normal variants and artifacts in PET imaging-significance. 10
9. Non-oncological application of PET-CT. 10
10. a) Fluorescent scanning. 5x2
    b) Role of PET-CT in lymphoma.
NUCLEAR MEDICINE

PAPER – IV

Time : 3 hours
Max. Marks : 100

Attempt all questions in order.
Each question carries 10 marks.

Write short notes on:

1. Radio-nuclide procedures for organ transplant assessment. 10
2. Work up and management of "Pregnant" lady with thyrotoxicosis. 10
3. a) INES
   b) Time of Flight (TOF) in PET 5x2
4. PET detectors - merits and demerits. 10
5. PET-MR: its status and applications. 10
6. a) Misadministration
   b) Standardized Uptake Value (SUV): uses and limitations 5x2
7. HVL and TVL of radiation shield. 10
8. a) Neutron monitors
   b) Dual time point imaging 5x2
9. a) Polar maps
   b) ATA guidelines 5x2
10. Status of radioimmunotherapy with specific examples to show its significance and utility. 10

......