

**Write short Notes on:**

1. Principles of gas filled detectors and their use in day to day Nuclear medicine practice.
2. Neutron Activation Analysis.
3. Interaction of radiation with matter and their utility in NM applicators.
4. Principles of radionuclide generator and elucidate upon secular & transient equilibrium.
5. What are radiation dose limits for occupational & general public? Describe significance.
6. TLD-Personal Monitoring.
7. Derive relationship between decay constant and half life.
8. NaI symporters.
9. Quality control in a RIA Lab.
10. Role of attenuation correction in myocardial perfusion imaging.

**Write short Notes on:**

1. Differentiate radiochemical from radio pharmaceutical .Explain mechanism of localization of radio-pharmaceuticals.
2. Lymphoscintigraphy
3. What is a collimator? Enumerate upon their significance and clinical application.
4. Non-fluorinated PET radio-pharmaceuticals.
5. Fluorescent scanning.
6. Helicobacter pylori breath test.
7. Recent advances in radionuclide therapy.
8. Nuclear medicine procedures in surgical emergencies.
9. Radioactive waste disposal in a hospital setting.
10. Radionuclide imaging in evaluation of epilepsy.

**Write short Notes on:**

1. Infection imaging with references to AIDS
2. Algorithmic evaluation of a solitary thyroid nodule and subsequent management.
3. Techniques in localization of parathyroid pathology.
4. Stress techniques in the evaluation of CAD.
5. Thyroiditis.
6. Justify: management of cancer is multidisciplinary.
7. Gastro-esophageal transit time: radionuclide techniques, significance and utility.
8. Importance of co registration.
9. Scintimammography and significance of sentinel lymph node evaluation.
10. FDG PET-CT in lymphoma.

**Write short Notes on:**

1. What collimator would you select for the given procedure and explain why a)  $I^{131}$  Uptake b) Tear duct scintigraphy
2. Use or significance of a) TOF b) Slip Ring.
3. Poisson & Gaussian distribution.
4. ROC Analysis
5. Principle of GM Counter and Importance of quencher.
6. What is r ray constant and calculate exposures rate for 100mg  $I^{131}$  at a distance of 0.5m
7. Given a chance to commission a "Nuclear Medicine" Deptt of today- How will you go about it in India?
8. Importance of crystals for PET. Which one you would select and why?
9. Importance of HVL & TVL with example.
10. Management of nuclear accident in a Nuclear Medicine Department

**Write short notes on:**

1. Methods to obtain beta dosimeter of a radionuclide
2. Relation between CET and RBE and its relevance
3. Dose limits prescribed by AERB AND ICRP
4. Biological effects of radiations
5. Describe in detail the method to ascertain critical organ of a new radiopharmaceutical
6. Dose response curve
7. Factors affecting the outcome of any radiation therapy
8. Monitoring and preventive practices in a PET-Cyclotron facility for radiation exposure
9. Radio protectors – examples, mode of action and their applications
10. Radiosensitizer – example, mode of action and their applications

**Write short notes on:**

1. The mechanisms of localization of radiopharmaceuticals
2. Generator produced radionuclides
3. Physical properties of technetium 99m
4. Radionuclide used in therapy of tumors
5. Iodination of protein
6. Labeling methods of Red blood cells
7. Quality control of radiopharmaceuticals
8. Production of  $^{18}\text{F}$  flurodeoxy glucose
9. Preparation of Tc-99 mm MIBI
10. Anatomy & physiology of kidney

**Write short notes on:**

1. Indications for bone scan
2. Flare phenomenon
3. Hyperparathyroidism – Tc 99m MIBI imaging
4. Cerebral perfusion SPECT study –procedure for Tc99m HMPAO or Tc 99m ECD
5. Drugs causing decreased uptake of radioactive iodine in thyroid gland
6. Principle of PET imaging with F18 FDG
7. Myocardial perfusion imaging with Tc 99m MIBI SPECT acquisition and reconstruction parameters
8. Modified PIOPED criteria for pulmonary embolism diagnosis-high and intermediate probability
9. Tc 99m Red Blood cell scan for gastrointestinal bleeding protocol
10. Dynamic renal scintigraphy with Tc 99m DTPA and GFR calculation

**Write short notes on:**

1. Working of a nuclear reactor
2. Types of distribution and its relevance in statistical analysis
3. Chi-square test
4. Types of collimator and their characteristics
5. Practical utilities of various types of radiation detector devices used in nuclear medicine
6. Interaction of radiation with matter – give examples of each type in practice
7. Waste management in a nuclear medicine department
8. How would you plan management of a nuclear accident in a reactor as a nuclear medicine physician
9. Salient criteria in selecting a workstation for a nuclear medicine department
10. Types of PET detectors – their merits and limitations



Write short notes on:

1. Radioactive Waste Disposal.
2. The Procedures employed in minimizing radiation hazards.
3. Radiation Hormesis.
4. The principles of PET Imaging.
5. Personal Monitoring.
6. The Interaction of radiation with matter.
7. Neutron Monitors.
8. Oxygen Enhancement Ratio.
9. Auto Radiography.
10. Apoptosis Imaging.

Write short notes on:

1. Characteristics of radio nuclides for bone pain palliation.
2. Quality control of radiopharmaceuticals.
3. Radiopharmaceuticals for SPECT brain imaging.
4. Give an account of non-fluorinated PET radiopharmaceuticals.
5. Methods and usefulness of in-vivo labeling of red blood cells.
6. Role of radiolabelled peptides in diagnosis and therapy.
7. Tracers in use for myocardial perfusion scintigraphy.
8. Radiopharmaceuticals used for liver imaging.
9. Radiopharmaceuticals in diagnosis and follow up of neuroendocrine disorders.
10. Advantages and disadvantages of Mo99-Tc99m generator systems.

Write short notes on:

1. Clinical application of Non-FDG Scintigraphy.
2. Radionuclide procedures for Organ Transplant Assessment.
3. Assessment of infectious bone lesion with nuclear techniques.
4. Clinical impact of co-registration imaging.
5. Work-up, treatment of thyrotoxic pregnant lady.
6. PIOPED criterion for pulmonary embolism and its drawbacks.
7. Radionuclide techniques for suspected breast malignancy.
8. Scope of nuclear techniques in neonatal hyperbilirubinemia.
9. Nuclear Medicine in management of patient of epilepsy.
10. Palliation of bone pain with radionuclides.

Write short notes on:

1. Generator produced PET Tracers and their application. Briefly mention about the basic principles of concentration of radiotracer.
2. Fan Beam Collimator.
3. Specific Absorbed Fraction.
4. HVL and TVL of Radiation Shield.
5. Quenching in GM Counter.
6. Linear Energy Transfer.
7. Derive equation of radioactive decay. Define decay constant; Half Life. Calculate the mass of ICI of carrier free Iodine -131.
8. Describe transient and secular equilibrium of radionuclides. Illustrate with a routinely used generator system.