

- Q.1** Explain the basic principle of the gamma camera and its collimator assembly. [14]
- OR**
- Q.1** Explain the Tc-99m generator with operation principle (milky cow generator). [14]
- Q.2** Explain various generation computed tomography machines. [14]
- OR**
- Q.2** Explain image quality parameters such as spatial resolution, noise, geometrical distortion, contrast and uniformity in detail. [14]
- Q.3** Explain the concept of delay tank and various waste disposal methods used in the nuclear medicine [14]
- OR**
- Q.3** Write a short note on Cyclotron in the Nuclear Medicine Department. [14]
- Q.4** What are different compartmental models used in Internal dosimetry? [14]
- OR**
- Q.4** Describe MIRD technique for dose calculations [14]
- Q.5** Attempt any **seven** out of twelve. (Each question is of **two** mark). [14]
- (i) Write three accelerator-based radionuclides.
 - (ii) Draw the ^{99}Mo decay scheme.
 - (iii) Which isotope used to detect thyroid carcinoma?
 - (iv) What is CT number of bone, air and water?
 - (v) What is full form of RIA and IRMA?
 - (vi) Which Diagnostic machine required NEMA test?

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- (vii) The detector of PET is made of -----
a) Silver b) Gadolinium c) Tungsten d) Lead
- (viii) The half-life of ^{18}F is 120 minutes (True/False)
- (ix) The most preferred radioisotope element in SPECT is
a) Mo b) W c) Tc d) Ba
- (x) What makes PET and SPECT so unique when it comes to nuclear imaging?
a) Do not require dyes b) Do not require X-Rays c) They show the metabolic functions d) They give more details about the imaged organ/tissue
- (xi) Which of the following is not a category of 2 compartment model?
a.) Two compartment model with elimination from the central compartment.
b.) Two compartment model with elimination from the peripheral compartment.
c.) Two compartment model with elimination from only plasma and blood.
d.) Two compartment model with elimination from both the compartments.
- (xii) SPECT includes a _____ for imaging.
a) Gamma Camera
b) Silver Halide Film
c) Phosphorus Sheet
d) Lead Sheet

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