

National Board of Examinations

Question Paper Name : DNB Nuclear Medicine Paper1

Is this Group for Examiner? : No

Enable Mark as Answered Mark for Review and Clear Response : Yes

Question Number : 1 Question Type : SUBJECTIVE

Explain what is meant by binding energy of the nucleus. Explain the meaning of the terms: mass difference, columbic barrier and the relationship between the mass difference and binding energy of a nucleus. What should be the minimum energy of Cyclotron to produce F-18? [3+3+4]

Question Number : 2 Question Type : SUBJECTIVE

- a) Describe the principle of gas filled detectors with voltage-current curve. [4]
- b) Discuss acceptance tests of a newly purchased dose calibrator. [6]

Question Number : 3 Question Type : SUBJECTIVE

- a) Describe briefly the various types of events detected by PET scanner. [3]
- b) Noise equivalent count rate. [2]
- c) Explain which in your mind is the best detector, what all detectors can be used, compare them preferentially. [5]

Question Number : 4 Question Type : SUBJECTIVE

- a) Enlist and discuss various non-imaging equipments used for patient study on day-to-day basis in nuclear medicine. [7]
- b) What is the major advantage of negative ion cyclotron over positive ion cyclotron. [3]

Question Number : 5 Question Type : SUBJECTIVE

- a) What are the common factors that affect the spatial resolution of a PET scanner? [6]
- b) Discuss phantoms used in nuclear medicine. [4]

Question Number : 6 Question Type : SUBJECTIVE

- a) McNemar Test and elaborate its significance [4+1]
- b) Case-control Study design and its utility [4+1]

Question Number : 7 Question Type : SUBJECTIVE

- a) Why Alpha particle therapy is so frequently discussed in Nuclear Medicine now? [4]
- b) Why 225-Actinium is called a nanogenerator? [6]

Question Number : 8 Question Type : SUBJECTIVE

Describe different methods of production of radionuclides, and discuss the merits and demerits of each method. [10]

Question Number : 9 Question Type : SUBJECTIVE

- a) What is radioactive decay? [2]
- b) Derive the equation: $n = n_0 e^{-\lambda t}$. Also derive the equation for half-life, and average life of radioactivity. [8]

Question Number : 10 Question Type : SUBJECTIVE

- a) Define Gray, Sievert and RBE? [2+2+2]
- b) What are the stochastic effects of ionizing radiation? [4]