SI.No.M21318 Course code : 32718202

VINAYAKA MISSION'S RESEARCH FOUNDATION, SALEM
B.Sc(NUCLEAR MEDICINE TECHNOLOGY) DEGREE EXAMINATIONS - September 2021
Second Year
PHYSICS OF NUCLEAR MEDICINE INSTRUMENTATION

Three Hours Maximum: 75 marks

SECTION - A

I. Choose the Best Answer : (10 x 1 = 10)

1. Electrons are positioned:
   a. inside the nucleus b. outside the nucleus
   c. both inside and outside the nucleus d. at all of the above locations

2. The radius of a nucleus is how much smaller than that of an atom:
   a. 10 times b. 100 times
   c. 1,000 times d. 10,000 times

3. The number of protons in a nucleus is expressed by the symbol:
   a. A b. Z
   c. X d. M

4. Which of the following is the smallest?
   a. a molecule b. an atom
   c. a nucleus d. an electron

5. Gamma-ray photons have:
   a. no mass and no electric charge
   b. no mass and an electric charge of +1
   c. no mass and an electric charge of +2
   d. no mass and an electric charge of -1

6. In spontaneous fission:
   a. nuclear stability is always achieved
   b. the nucleus splits into 2 or 3 fragments
   c. the fragments are never radioactive
   d. the nucleus is unchanged

7. Internal Conversion involves:
   a. the emission of a gamma-ray
   b. the conversion of a neutron to a proton
   c. K-capture
   d. none of the above processes

(p.t.o.)

8. The Decay Constant is a measure of:
   a. only the number of alpha particles emitted
   b. only the number of beta particles emitted
   c. only the number of gamma rays emitted
   d. none of the above
9. The Half Life of 99m-Tc is 6 hours. After how much time will one eighth of the radioactivity in a sample remain?
   a. 6 hours b. 12 hours
   c. 18 hours d. 24 hours
10. If ln x = y, then:
   a. ln y = x b. exp y = x
   c. exp y = -x d. exp -y = x

II. Write Short Answers on any FIVE of the following: (5 x 5 = 25)

11. Standard deviation.
12. Shielding requirement of well counter.
13. The dot factor in imaging of radioactivity.
14. Field of view.
15. Radioimmuno Assays.
16. Positron Emitting Isotpoes.
17. Isomeric Transition.

III. Write Short Essays on any TWO of the following: (2 x 10 = 20)

18. Isotope Calibrator
19. System Resolution.
20. Integral and differential counting.
21. Isotope Calibrator.

IV. Write Essays on any ONE of the following: (1 x 20 = 20)

22. Explain the different types of collimators used in Gamma Camera.
23. Gas filled radiation detectors.

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