VINAYAKA MISSION'S RESEARCH FOUNDATION, SALEM
(Deemed to be University)

B.Sc(NUCLEAR MEDICINE TECHNOLOGY) DEGREE EXAMINATIONS - August 2019
First Year

BASIC PHYSICS AND NUCLEAR MEDICINE PHYSICS

Three Hours   Maximum: 75 marks

SECTION - A

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

1. Material gain electron means it gets
   a) Positive charge   b) Negative Charge c) No charge d) Equal charge

2. Intensity of radiation
   a) $I \alpha (kVp)1/3$ b) $I \alpha (kVp)1/2$ c) $I \alpha (kVp)3$ d) $I \alpha (kVp)2$

3. The scattered photon will be scattered back with $\theta =$
   a) 0°   b) 90°   c) 180°   d) 45°

4. Range of beta rays
   a) 1.4×107 to 1.7×107 b) 0.3 c to 0.99 c
   c) 1.5×107 to 2.7×107 d) 0.3 c to 0.77 c

5. 14. Velocity of electromagnetic wave
   a) $v = \lambda/f$ b) $v = \lambda f$ c) $v = (\lambda f)2$ d) $f = \lambda v$

6. The process of removal of ortbital electrons from the neutral atom is
   a) ionization   b) excitation   c) No ionization & excitation   d) None of the above

7. If a low-energy collimator is (incorrectly) used with a high-energy radionuclide the results would be:
   a) A reduced camera sensitivity (counting efficiency).   b) A blurred image.
   c) A reduced field of view.   d) Reduced image detail.

8. The materials having very small susceptibility at all temperatures are
   a) Antiferromagnetic   b) Diamagnetic   c) Ferromagnetic   d) Paramagnetic

9. For diamagnetic material, which of the following is correct?
   a) Magnetic susceptibility < 0   b) Magnetic susceptibility > 0
   c) Magnetic susceptibility = 0   d) None of the mentioned

10. Number of protons in the nucleus is called _____
    a)Atomicnumber   b)Mass number   c)Electric charge   d) Periodic number

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

11. Briefly explain Ammeter.
12. Explain the following terms: a) emission spectra b) continuous spectra
13. Write the basic concepts of fluorescence and Phosphorescence.
14. Write the properties of alpha radiation.

(p.t.o.)

15. Discuss about artificial radioactivity.
16. Describe the electromagnetic induction .
17. Write about radiometric quantities.

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

18. Define:
    a) Electric charge   b) Electric Induction   c) Coulombs law
    d) Ohms law   e) Electric power
19. Write the properties of alpha beta and gamma radiation.
20. Write about production of X-Rays.
21. Write the properties of magnetic materials.

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

22. What is meant by radioactivity? Explain the properties of radiation and its transformation process (Disintegration law).
23. Explain the interaction between x-rays and particles.

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