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(FOR THE CANDIDATES ADMITTED DURING THE ACADEMIC YEAR 2020-21 ONLY)

SUBJECT CODE 20 UPS 613

REG.NO. :

N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI

END-OF-SEMESTER EXAMINATIONS : MAY – 2023

B.Sc. – PHYSICS **MAXIMUM MARKS: 70**

VI SEMESTER **TIME : 3 HOURS**

PART – III

ATOMIC AND NUCLEAR PHYSICS

SECTION - A (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS.
MULTIPLE CHOICE QUESTIONS. (K1)

1. The number of photoelectrons emitted for a light of frequency is proportional to _____.
   (a) Threshold frequency (b) intensity of light (c) v-vo (d) frequency of light
2. Compton effect shows that _____.
   (a) X rays are waves (b) X rays have high energy
   (c) X rays can penetrate matter (d) photons have momentum
3. Nuclei having the same number of neutrons but different mass number are called _____.
   (a) isobars (b) Isotones (c) Isomers (d) Isotopes
4. The main source of energy in sun is _____.
   (a) Nuclear fission (b) Nuclear Fusion
   (c) chemical reaction (d) mechanical energy
5. Which of these is a Boson?
   (a) electron (b) proton (c) neutron (d) photon

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES (K2)

6. Define critical potential.
7. What is Moseley's law?
8. What is internal conversion?
9. Define multiplication factor.
10. What are Leptons?

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SECTION – B (5 X 4 = 20 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)

11. a) Derive Einstein's photoelectric equation with a concept of work function.

(OR)

b) What are the various spectral series in Hydrogen Spectra? Explain with transition of electrons between these levels.

12. a) Describe the powdered crystal method of studying crystal structure.

(OR)

b) Explain the Continuous and Characteristic X ray spectrum.

13. a) Write a short note on Binding energy of the nucleus.

(OR)

b) Explain the Geiger and Nuttal law with experiment.

14. a) What is nuclear fission? Discuss with an example

(OR)

b) Describe the construction and working of a scintillation counter.

15. a) Summarize the classification of elementary particles.

(OR)

b) Explain the origin of cosmic rays.

SECTION – C (4 X 10 = 40 MARKS)

ANSWER ANY FOUR OUT OF SIX QUESTIONS
(16th QUESTION IS COMPULSORY AND ANSWER ANY THREE QUESTIONS (FROM Qn. No : 17 to 21) (K4 (Or) K5)

16. What is refered as chain reaction? Discuss chain reaction in detail.

17. Discuss Franck and Hertz's experimental determination of critical potentials.

18. Give the theory of Compton effect and briefly explain its experimental verification.

19. Explain Liquid drop model and discuss the various energies associated with semi empirical mass formula.

20. Describe the construction and working of a cyclotron. Discuss its limitations.

21. What are known as cosmic ray shower? Explain the phenomenon with origin of cosmic ray shower.

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ETHICAL PAPER