(NO. OF PAGES: 2)

(FOR THE CANDIDATES ADMITTED **19UPS613**

DURING THE ACADEMIC YEAR 2019 ONLY) **REG.NO.**

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

END-OF-SEMESTER EXAMINATIONS: JULY-2022

B.Sc. PHYSICS **MAXIMUM MARKS: 75**

SEMESTER: VI **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.Charge of an electron was discovered by Millikan in the year _____.

(a) 1906 (b)1909 (c) 1908 (d) 1905

2. *X*-rays when incident on a metal _____.

(a) Exert a force on it (b) Transfer energy to it

(c) Transfer pressure to it (d) All of the above

3. Which of the following is the best explanation for the process of nuclear fission?

(a) liquid drop model (b) proton proton cycle

(c) independent particle model (d) sommerfield model

4. The sun gets its energy from which of the following _____.

(a) Nuclear fission (b) photo electric effect

(c) Chemical reaction (d) nuclear fusion

5. The interaction that describes the forces among nucleons that hold nuclei together is ____.

(a) strong nuclear interaction (b) electromagnetic interaction

(c) weak interaction (d) gravitational interaction

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

6. What is know as Ionisation potential.
7. State " Moseley's Law?
8. What are magic numbers?
9. What is nuclear fusion?
10. Define pair production.

SECTION – B (5 X 5 = 25 MARKS)

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

11. a) Derive Einstein's photoelectric equation.

(OR)

b) Define Pauli's exclusion principle. On the basis of this principle explain the configuration of electrons in atoms.

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12. a) Give an account of the production of X – rays with experimental setup..

(OR)

b) Discuss continuous X-ray spectrum.

13. a) List the general properties of nucleus and explain..

(OR)

b) Briefly explain internal conversion.

14. a) Explain the process of nuclear fission, with an example . Explain the process of nuclear fission with examples.

(OR)

b) Give the limitations of cyclotron and discuss..

15. a) Discuss the theory of the cosmic ray showers.

(OR)

b) Write a short note on conservation laws in elementary particles.

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. Explain the working of proportional counter.

17. Describe Millikan's oil drop method for the determination of electronic charge.

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

19. Explain liquid drop model and discuss the semi empirical mass formula.

20. Describe GM counter and explain its working as a particle detector.

21. What are Quarks? Explain about 'Quark Model'.

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