

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2024
(Fourth Semester)

Common to Branches – CHEMISTRY & BIOCHEMISTRY

PHYSICS - II

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

- The bending of waves around the edges of an obstacle is called _____.
 (i) diffraction (ii) polarization
 (iii) interference (iv) reflection
- Spinning electron hypothesis is the distinct feature of _____.
 (i) Bohr atom model (ii) Sommerfeld atom model
 (iii) Vector atom model (iv) Thomson atom model
- The sequence of magic numbers in Shell model are _____.
 (i) 8, 2, 28, 20, 82, 50, 126 (ii) 2, 8, 20, 28, 50, 82, 126
 (iii) 126, 8, 20, 280, 50, 182, 2 (iv) 2, 12, 128, 250, 382, 126
- The relativistic expression for length contraction of an object is _____.
 (i) $l_0 = l \sqrt{1 - (v^2/c^2)}$ (ii) $l = l_0 \sqrt{1 - (v^2/c^2)}$
 (iii) $l = l_0 \sqrt{1 + (v^2/c^2)}$ (iv) $l = \frac{l_0}{\sqrt{1 - (v^2/c^2)}}$
- An _____ gate is a logic gate whose output is high if and only if all the inputs are in high state.
 (i) AND (ii) OR (iii) NAND (iv) NOR

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- a Write short notes on plane transmission grating.
OR
b Write about double refraction.
- a State Pauli's exclusion principle.
OR
b What is known as the electronic configuration of an atom? Give examples.
- a Write about the nuclear size.
OR
b Write Semi empirical mass formula and explain the various terms.
- a State the postulates of special theory of relativity.
OR
b What is time dilation in relativity? Give its expression.
- a Give the logical expression and truth table for AND and NOT gates.
OR
b Prove that $A + \bar{A}B = A+B$.

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 6 = 30)

11. a Describe the air wedge method for determining the thickness of a thin wire.
OR
b With the help of a neat diagram, describe the Michelson interferometer and explain how it is used to measure the wavelength of a given light?
12. a Discuss about the various quantum numbers associated with Vector atom model.
OR
b Write short notes on Spatial quantization.
13. a Describe the construction and working of an Ionization chamber.
OR
b Explain the shell model of nucleus.
14. a Derive Einstein's Mass – Energy relation.
OR
b Derive Lorentz transformation equations.
15. a Describe how a Zener diode can be used as a Voltage Regulator?
OR
b Explain the construction an OR gate using diodes. Also, explain its operation using its truth table.

Z-Z-Z

END