(6 pages) **Reg. No. :** .....

Code No. : 10738 E **Sub. Code : EEPH 21**

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2024.

Second Semester

Physics

Elective – ALLIED PHYSICS – II

(For those who joined in July 2023 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. An important application of interference in thin film is

   (a) Grating

   (b) Newton's ring

   (c) Zone plate

   (d) Air wedge

2. The example for optically active materials

   (a) Quartz

   (b) Sugar

   (c) Sodium chloride

   (d) All

3. At threshold frequency the K.E of photo electrons is

   (a) one (b) two

   (c) zero (d) three

4. The displacement of either outer line from the central line is known as

   (a) Zeeman shift

   (b) Zeeman effect

   (c) Longitudinal effect

   (d) Normal Zeeman effect

5. A liquid drop has a spherical shape due to

   (a) Viscosity

   (b) Surface tension

   (c) Surface energy

   (d) Normal

6. The mass of the fissile material at the critical size is called

(a) Critical mass

(b) Critical velocity

(c) Critical potential

(d) Both (a) and (b)

7. The equation for Length contraction is

(a) $L = I_O\left(1 - V^2\right)$

(b) $L = \dfrac{I_O}{1 - V^2}$

(c) $L = I_O \sqrt{\dfrac{1 - V}{C^2}}^2$

(d) $L = I_O \left(1 - \dfrac{V}{C^2}^2\right)$

8. When the observer is in moving condition the sphere is 100k like

(a) Ellipsoid (b) Circle

(c) Square (d) Rectangle

9. The potential barriers for silicon is

(a) 0.8 V (b) 0.9 V

(c) 0.7 V (d) 0.6 V

10. The arrow in the diode points in the direction of

(a) Conventional current

(b) Conventional voltage

(c) Both

(d) Knee voltage

PART B — (5 × 5 = 25 marks)

Answer ALL questions by choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) Differentiate between Interference and diffraction.

Or

(b) Explain the phenomenon "optical activity". Define specific rotatory power.

12. (a) State and explain Pauli's exclusion principle.

Or

(b) Write the applications of photo electric effect.

13. (a) What are magic numbers? Explain.

Or

(b) Define Nuclear fission. Explain the release of energy during nuclear fission.

14. (a) State the Lorentz transformation equation.

Or

(b) Write a note on Time dilation.

15. (a) Explain V-I characteristics of a Zener diode.

Or

(b) Describe how a Zener diode can be used as a voltage regulator.

PART C — (5 × 8 = 40 marks)

Answer ALL questions by choosing either (a) or (b).
Each answer should not exceed 600 words.

16. (a) Give the theory of interference in thin films.

Or

(b) Describe the air wedge method for determining the thickness of a thin wire.

17. (a) Explain the Bohr atom model.

Or

(b) Describe the theory of zeeman effect.

18. (a) Explain how the mass defect is able to explain the release of fission energy.

Or

(b) Define chain reaction. Explain controlled and uncontrolled chain reaction.

19. (a) What is the meaning of mass energy equivalence obtain Einstein's mass energy relation?

Or

(b) Discuss Length contraction and derive expression for it.

20. (a) What is p-n junction diode? Explain forward and reverse biasing of junction diode.

Or

(b) Explain with circuit diagram the construction and working of voltage regulator.

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