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

Code No. : 30941 E **Sub. Code : FEPH 11/ EEPH 31**

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

First Semester

Physics

Elective — ALLIED PHYSICS — I

(For those who joined in July 2024 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer.

1. Which of the following variables has zero value at the extreme position in SHM?
   (a) Acceleration
   (b) Speed
   (c) Displacement
   (d) Angular frequency

2. When is ultrasonic .waves produced using piezo electric oscillator?
   (a) At constant temperature
   (b) At resonance
   (c) At constant pressure
   (d) At constant voltage

3. Which of the following represents viscosity?
   (a) Potential energy stored in fluid
   (b) Resistance to fluid motion
   (c) Roughness of the surface
   (d) The pressure difference between the two fluids

4. The surface of the water in contact with the glass wall is
   (a) plane (b) concave
   (c) convex (d) both (a) and (b)

5. The measure of disorder of molecules are called
   (a) Entropy (b) Thermodynamics
   (c) Joule's effect (d) Enthalpy

6. In actual practice all the energies are

(a) Reversible (b) Irreversible

(c) Same (d) Not change

7. Biot-Savart law expressed in alternate way is called

(a) Ampere's circuital law

(b) Ohm's law

(c) Newton's law

(d) Tangent law

8. E.rms is equal to

(a) $\frac{E_0}{\sqrt{2}}$ (b) $E_0\sqrt{2}$

(c) $\frac{\sqrt{2}}{E_0}$ (d) $\sqrt{2}E_0$

9. If both the inputs are closed or any one of them is closed the gate is

(a) OR (b) AND

(c) NOT (d) NAND

10. $AB + \overline{AC} =$

(a) $(A + B)(A + \overline{A})$ (b) $(A + C)(\overline{A} + B)$

(c) $\overline{A} + \overline{B}$ (d) $\overline{AB}$

PART B — (5 × 5 = 25 marks)

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

11. (a) What are Lissajous figures? Write the uses of Lissajous figures.

Or

(b) Describe the production of ultrasonic waves by piezoelectric method.

12. (a) Describe an experiment to determine Young's modulus of a bar by non uniform bending method.

Or

(b) Describe drop weight method to determine surface tension of a liquid.

13. (a) Explain Joule Kelvin effect.

Or

(b) Explain the change of entropy in a reversible process.

14. (a) State and explain Biot Savart's law.

Or

(b) What is a fuse? Explain the working of fuse.

15. (a) Give the truth table of NAND gate and explain.

Or

(b) State and prove Demorgan's theorem.

PART C — (5 × 8 = 40 marks)

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

16. (a) Discuss with theory, the composition of two simple harmonic motion in a straight line.

Or

(b) Explain how the A.C. frequency is measured using sonometer.

17. (a) Describe the theory of uniform bending.

Or

(b) Explain briefly the molecular theory of surface tension.

18. (a) Describe with theory and results of porous plug experiment.

Or

(b) Explain Carnot's cycle with a diagram.

19. (a) Describe the measurement of thermo emf using potentiometer.

Or

(b) Derive an expression for the R.M.S. value of alternating voltage.

20. (a) Explain how the NOR gate can be converted into OR, NOT and AND gates.

Or

(b) State and explain theorems of Boolean Algebra.

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