

(6 pages)

Reg. No. :

Code No. : 20392 E Sub. Code : CAPH 11

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

First/Third Semester

Physics – Allied

ALLIED PHYSICS – I

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — ($10 \times 1 = 10$ marks)

Answer ALL questions.

Choose the correct answer.

1. The unit of Hooke's law is

- (a) Nm
- (b) Nm^{-2}
- (c) Nm^{-1}
- (d) Nsm

2. In young's modulus the diameter of the wire is doubled its length is

- (a) Halved
- (b) One by fourth
- (c) Three by fourth
- (d) Two by fourth

3. Excess pressure inside a liquid drop is

- (a) $\frac{T}{r}$
- (b) $\frac{2T}{r}$
- (c) $\frac{4T}{r}$
- (d) $\frac{3T}{r}$

4. The molecular range for solids and liquids is

- (a) $10^{-8}m$
- (b) $10^{-7}m$
- (c) $10^{-9}cm$
- (d) $10^{-5}cm$

5. When a body vibrates with its own natural frequency is called

- (a) Damped oscillations
- (b) Free oscillation
- (c) Electromagnetic oscillations
- (d) Oscillation

6. Maximum displacement is called
- (a) Amplitude (b) Velocity
(c) Oscillation (d) Time period
7. Dimensional formula for coefficient of thermal conductivity is
- (a) MLT (b) $MLTQ^{-1}$
(c) $MLT^{-3}Q^{-1}$ (d) $MLT^{-2}Q^{-1}$
8. Identify the very good insulator
- (a) Saw dust (b) Cork
(c) Asbestos sheet (d) Glass wool
9. Interface was first observed by
- (a) Thomas young (b) Newton
(c) Ohm (d) Galileo
10. What is the phase difference of emerging wave is half wave plate
- (a) 90° (b) 180°
(c) 270° (d) 360°

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Calculate work done in stretching a wire.

Or

- (b) Discuss the theory of Torsion Pendulum.

12. (a) Define (i) Surface tension with its unit and dimensions (ii) Viscosity.

Or

- (b) Describe Stoke's formula for highly viscous liquid.

13. (a) Write a note resonance in SHM.

Or

- (b) State and explain Longitudinal mode of vibrations.

14. (a) Obtain expression for viscosity and thermal conductivity.

Or

- (b) Explain Distribution of energy in black body spectrum.

15. (a) Obtain condition for interference.

Or

- (b) Describe production and detection of plane polarized light.

PART C — ($5 \times 8 = 40$ marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Describe the experimental determination of Young's modulus using Pin and microscope by uniform bending.

Or

- (b) Derive expression for couple per unit twist.

17. (a) Derive expression for excess of pressure inside a synclastic and anticlastic surface.

Or

- (b) Explain analogy between liquid flow and current flow.

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18. (a) Explain the composition of two SHMs along a straight line and in perpendicular direction.

Or

- (b) Define simple harmonic motion. Explain velocity acceleration and period of SHM.

19. (a) Describe the Lees disc experiment to find the thermal conductivity of bad conductor.

Or

- (b) State and explain Wiedmann-Franz law.

20. (a) Explain how the rectilinear propagation of light is explained by Fresnel.

Or

- (b) Explain production and detection of plane elliptically polarised light.

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