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

Code No. : 20470 E **Sub. Code : CAPH 11**

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2021.

First 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. Work done in deforming a body is

   (a) Stress × strain

   (b) Stress/Strain

   (c) $\frac{1}{2}$ × stress × strain

   (d) both (a) and (b)

2. For perfect rigid body, young's modulus is

(a) zero (b) 1

(c) –1 (d) infinity

3. The temperature at which surface tension of a liquid becomes zero is called

(a) critical temperature

(b) anomalous temperature

(c) absolute temperature

(d) both (a) and (b)

4. The Stoke's law for highly viscous liquids

(a) $\eta\, a\, V$ (b) $16\,\pi\,\eta\, a\, V$

(c) $6\,\pi\,\eta\, a\, V$ (d) $6\,\pi\,\eta\, a^2\, V$

5. The velocity of sound is higher in

(a) iron (b) brass

(c) steel (d) metal

6. The frequency of free oscillation is

(a) $n = 2\,\pi\sqrt{\frac{k}{m}}$ (b) $\frac{1}{2\,\pi}\sqrt{\frac{k}{m}}$

(c) $\frac{1}{2\,\pi}\sqrt{\frac{m}{k}}$ (d) $2\,\pi\sqrt{\frac{m}{k}}$

7. The matter with least value of thermal conductivity

(a) air (b) water

(c) ash (d) window glass

8. The wavelength of radiation of temperature of black body is

(a) 2.9×10^{-3}m (b) 2.9×10^{-6}m

(c) 2.9×10^{-6}cm (d) 2.9×10^{-3}cm

9. If the wavelength of wave is large then the degree of diffraction observed is

(a) less (b) more

(c) zero (d) equal

10. What is the path difference of emerging wave in quarter wave plate?

(a) $\frac{\lambda}{4}$ (b) $\frac{\lambda}{2}$

(c) $\frac{\lambda}{3}$ (d) λ

PART B — (5 × 5 = 25 marks)

Answer ALL questions by choosing (a) or (b).

Each answer should not exceed 250 words.

11. (a) Define E, G, K and V. Obtain the relations connecting these quantities.

Or

(b) Derive expression for the bending moment.

12. (a) Discuss briefly excess pressure inside a liquid drop.

Or

(b) Derive expression for terminal velocity.

13. (a) Describe the phase of simple harmonic motion.

Or

(b) Outline the theory of forced vibrations.

14. (a) Describe the coefficient of thermal conductivity.

Or

(b) Explain the verification of Newton's law cooling.

15. (a) Describe the theory of Fresnel and Fraunhofer diffraction.

Or

(b) Describe production and detection of circularly polarized light.

PART C — (5 × 8 = 40 marks)

Answer ALL questions by choosing (a) or (b).

Each answer should not exceed 600 words.

16. (a) Define and explain :

(i) Plane of bending

(ii) Neutral axis.

Or

(b) Discuss the theory of twisting couple of wire.

17. (a) Define and explain :

(i) Surface tension with its unit and dimensions.

(ii) Cohesive forces and Adhesive forces.

Or

(b) Explain Stoke's method for the coefficient of viscosity of a viscous liquid.

18. (a) Explain forced vibrations and resonance.

Or

(b) Explain the determination of frequency of tuning fork.

19. (a) Explain transport phenomena in detail.

Or

(b) Define black body radiation. Explain distribution of energy in black body spectrum.

20. (a) Explain the phenomenon of polarisation by double refraction.

Or

(b) Explain the experiment to determine wavelength normal incidence method.

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