

(6 pages)

Reg. No. :

Code No. : 40315 E Sub. Code : JAPH 11/
SAPH 11

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2019.

First Semester

Physics – Allied

PHYSICS – I

(For those who joined in July 2016 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. In uniform bending the elevation (y) is related to young's modulus (q) by the relation

- (a) $y \propto q$ (b) $y \propto \frac{1}{q}$
(c) $y \propto q^2$ (d) none

2. The work done in twisting a wire is _____
(C -twisting couple)

- (a) $2C\theta^2$ (b) $\frac{1}{2}C\theta^2$
(c) $\frac{1}{2}C\theta$ (d) None

3. Surface tension is the property of liquids that they tend to _____ surface area.

- (a) increase (b) decrease
(c) constant (d) none

4. The profile a advancing liquid through a tube is _____.

- (a) Straight line (b) Parabola
(c) Semicircle (d) None

5. Simple pendulum is an example for _____ motion.

- (a) Unharmonic (b) Forced Vibrations
(c) Simple harmonic (d) None

6. The distance between two successive anti-nodes is _____.

- (a) λ (b) $\lambda/4$
(c) $\lambda/2$ (d) 0

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7. Newton's law of cooling method used to find the thermal conductivity of _____.
(a) Good conductor
(b) Bad conductor
(c) Liquid
(d) None
8. According to Wiedmann Franz's law the ratio between thermal conductivity and electrical conductivity is _____ absolute temperature.
(a) directly proportional
(b) inversely proportional
(c) independent of
(d) none
9. In Fraunhofer diffraction the shape of the incident wave front is _____.
(a) Plane (b) Spherical
(c) Elliptical (d) None
10. The path difference for destructive interference between two beams is _____.
(a) $n\lambda$ (b) $(n+1)\lambda/2$
(c) $(2n-1)\lambda/2$ (d) none

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PART B — ($5 \times 5 = 25$ marks)

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

Each answer should not exceed 250 words.

11. (a) Derive the expression for work done in stretching a wire.
Or
(b) Derive the expression for the bending moment of beam.
12. (a) Define surface tension. How it is explained by molecular theory?
Or
(b) Give the analogy between current flow and liquid flow.
13. (a) Define simple harmonic motion. What are the characteristics of simple harmonic motion?
Or
(b) What are Lissajou's figures? How they are produced?

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14. (a) Define coefficient of thermal conductivity. Obtain its unit.

Or

- (b) State and explain Newton's law of cooling.

15. (a) What is a grating? Explain its construction.

Or

- (b) What is double refraction? Describe how it is produced in a crystal.

PART C — ($5 \times 8 = 40$ marks)

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

Each answer should not exceed 600 words.

16. (a) Explain the determination of Young's modulus of a beam by uniform bending method using pin and microscope arrangement.

Or

- (b) Explain the determination of rigidity modulus using torsional pendulum.

17. (a) Derive the expression for the excess pressure in a synclastic surface.

Or

- (b) Discuss the experimental determination of coefficient of viscosity of highly viscous liquid.

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18. (a) Discuss the resultant motion of a particle acted upon by two simple harmonic motions perpendicular to one another.

Or

- (b) Explain Melde's string method of determining the frequency of a tuning fork by longitudinal mode.

19. (a) Discuss the Lee's disc method of determining the thermal conductivity of a bad conductor.

Or

- (b) State and prove Wiedemann-Franz law.

20. (a) Discuss the determination of wavelength of light using plane transmission grating.

Or

- (b) Explain in detail the production and detection of plane polarized light.

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