



C16-EC-103

5142

BOARD DIPLOMA EXAMINATION, (C-16)
MARCH/APRIL—2018
DECE—FIRST SEMESTER EXAMINATION
ENGINEERING PHYSICS—I

Time : 3 hours]

[Total Marks : 80

PART—A

2×15=30

Instructions : (1) Answer *any fifteen* questions.
(2) Each question carries **two** marks.
(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Write the dimensional formula for (a) power and (b) surface tension.
2. Write any two dimensionless quantities.
3. Write the supplementary physical quantities and their units.
4. State the principle of homogeneity of dimensions.
5. Write the Einstein's photoelectric equation and name the terms involved in the equation.
6. Define critical angle in refraction of light.
7. Define superconductivity.
8. Name the types of optical fibre.
9. Convert 37.6 °C into kelvin.

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10. Write any two differences between gas constant and universal gas constant.
11. State the second law of thermodynamics.
12. Define molar specific heats of a gas.
13. Write two examples for scalar and vector quantities.
14. State the triangle law of vector addition.
15. Find the magnitude of the vector $\vec{A} = 2\hat{i} + 3\hat{j} + 4\hat{k}$.
16. State the vector product of two vectors and write its formula.
17. Define acceleration due to gravity and write its SI unit.
18. A body is allowed to fall freely from a height of 2000 m. Find the time taken to reach the ground ($g = 10 \text{ m/s}^2$).
19. Define projectile and give one example.
20. Define time of flight and write its expression for the vertically projected body.

PART—B

10×5=50

- Instructions :** (1) Answer any **five** questions.
 (2) Each question carries **ten** marks.
 (3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

21. (a) Explain the basic principle of optical fibre. 6
 (b) Explain the working of photoelectric cell. 4
22. (a) Write any five applications of photoelectric effect. 5
 (b) Write any five applications of superconductors. 5

- 23.** (a) ^{*} Derive ideal gas equation. 7
- (b) A gas at 30 °C has its temperature raised so that volume is doubled and the pressure remaining constant. What is its final temperature? 3
- 24.** (a) Derive the relation $C_P - C_V = R$. 7
- (b) Distinguish between isothermal and adiabatic processes. 3
- 25.** (a) State the parallelogram law of addition of vectors. Derive an expression for magnitude and direction of resultant of two vectors. 1+6=7
- (b) A force $\vec{F} = 2\hat{i} + 3\hat{j} + 4\hat{k}$ N acts on a body and displaces it through $\vec{S} = \hat{i} + 2\hat{j} + \hat{k}$ metre. What is work done? 3
- 26.** (a) Define dot product of two vectors. Write any four properties of dot product. 2+4=6
- (b) The magnitude of the cross-product is equal to $\frac{1}{\sqrt{3}}$ times the dot product. Find the angle between them. 4
- ^{*} **27.** (a) Show that the path of a projectile in oblique projection is a parabola. 7
- (b) A stone is projected vertically upwards from the top of the tower with a velocity of 4.9 m/s². If it reaches the ground after 5 seconds, find the height of the tower. 3
- 28.** (a) Derive expressions for (i) maximum height and (ii) time of ascent of a body in vertical motion. 6
- (b) The maximum height reached by a projectile is equal to its range. Find the angle of projection. 4
