



C16-C/CM-103

5114

BOARD DIPLOMA EXAMINATION, (C-16)
MARCH/APRIL—2018
DCE—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. What are fundamental units? Give two examples.
2. Write the base units for thermodynamic temperature and luminous intensity.
3. What are dimensionless quantities? Give two examples.
4. The velocity of a body is given by the equation $V = At$, where t is the time. Find the dimensional formula for A .
5. What is photoelectric effect?
6. Define refraction of light.
7. Name different types of optical fibers.
8. What is a superconductor? Give two examples.

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9. State and explain Boyle's law.
10. Convert 27 °C to absolute temperature.
11. Define molar specific heat of a gas at constant volume.
12. What is universal gas constant? State its SI units.
13. State whether the following are scalars or vectors :
- (a) Temperature
- (b) Force
14. Define Like vectors.
15. Find the magnitude of the vector $\vec{A} = 2i + 3j + 4k$.
16. If i , j and k are unit vectors, find the values of $i \cdot i$ and $i \cdot j$.
17. Define acceleration due to gravity.
18. What are the angles of projections in case of vertical and horizontal projections?
19. A body is allowed to fall freely from a height of 4.9 m. Find the time taken to reach the ground.
20. Define projectile. Give one example.

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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) Write Einstein photoelectric equation and explain the terms. 4
- (b) State any six applications of photoelectric effect. 6
22. (a) What is critical angle? Explain with a figure. 4
- (b) State any six applications of superconductor. 6

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23. (a) ^{*} What is an ideal gas? Derive the ideal gas equation. 1+6
 (b) One litre of air at 27 °C is heated until the pressure and volume are doubled. Find the final temperature. 3
24. (a) Derive the relation $C_P - C_V = R$. 6
 (b) Write any four differences between isothermal process and adiabatic process. 4
25. (a) State Triangle law of vectors. 3
 (b) Derive an expression for magnitude and direction of the resultant vector using parallelogram law. 7
26. (a) Define dot product and cross product of two vectors. 4
 (b) Find the dot product and cross product of two vectors $\vec{A} = 2i + 3j + 4k$ and $\vec{B} = 4i + 2j + 3k$. 2+4
27. (a) Derive the expressions for time of ascent and time of flight for a vertically projected body. 4+3
 (b) A body is projected vertically with a velocity of 98 m/s from the ground. Find the time of ascent. 3
28. (a) Show that the path of a projectile is a parabola in case of an oblique projection. 7
 (b) An aeroplane flying horizontally with a speed of 270 km/h releases a body at a height of 490 m from the ground. Find when and where the body will strike the ground. 3
