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C-14-C/CM-103

4016

BOARD DIPLOMA EXAMINATION, (C-14)

APRIL/MAY—2015

DCE—FIRST YEAR EXAMINATION

ENGINEERING PHYSICS

Time : 3 hours ]

[ Total Marks : 80

PART—A

3×10=30

**Instructions :** (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed **five** simple sentences.

1. Write any three advantages of SI system of units.
2. Define scalars and vectors, and write two examples of each.
3. A body is allowed to fall freely from a height of 2000 m. Find the time taken to reach the ground ( $g = 10 \text{ m/s}^2$ ).
4. Write any three conditions for SHM.
5. Write any three differences between isothermal and adiabatic processes.
6. Distinguish between musical sound and noise.
7. Define coefficient of viscosity and write its SI unit and dimensional formula.

8. Define stress and state Hooke's law.
9. State first and second laws of Kirchhoff.
10. Write any three applications of optical fibers.

**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.

11. (a) Define scalar product and vector product of two vectors. 5
- (b) Find the dot product and cross product of two vectors  $\vec{A} = 2\vec{i} + 3\vec{j} + 4\vec{k}$  and  $\vec{B} = 4\vec{i} - 2\vec{j} + 3\vec{k}$ . 5
12. (a) Derive the expression for time of flight and range of a projectile in oblique projection. 6
- (b) A stone is allowed to fall freely from the top of tower 300 m high and at the same time another stone is projected vertically upwards with a velocity of  $75 \text{ ms}^{-1}$ . Find when and where the two stones will meet. 4
13. (a) Write any five advantages of friction. 5
- (b) Derive the expression for acceleration of a body moving up on a smooth inclined plane with necessary diagram. 5
14. (a) State and prove the law of conservation of energy in the case of a freely falling body. 7
- (b) A bullet of mass 10 grams is fired with a velocity of  $300 \text{ ms}^{-1}$ . Find its kinetic energy. 3

15. (a) Derive the expressions for (i) velocity and (ii) acceleration of a particle executing SHM. 6
- (b) Find the acceleration due to gravity ( $g$ ) at a place where the length of the seconds pendulum is 1 m. 4
16. (a) State the first law and second law of thermodynamics. 4
- (b) A gas occupies 25 litre under a pressure of 72 cm of Hg at  $37^\circ\text{C}$ . What will be the volume when 75 cm of Hg pressure is applied at  $27^\circ\text{C}$ ? 6
17. (a) Define longitudinal and transverse wave motion. 4
- (b) State any four conditions of good auditorium. 4
- (c) Define reverberation. 2
18. (a) State and explain Ohm's law. 4
- (b) Derive an expression for the magnetic induction field strength  $B$  at a point on the axial line of a bar magnet. 6

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