



C14-C/CM-103

4016

BOARD DIPLOMA EXAMINATION, (C-14)

OCT/NOV—2016

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. Define dimensional formula of a physical quantity. Write the dimensional formula of force.
2. Define scalar and vector quantities and give two examples of each.
3. Derive an expression for maximum height reached by a vertically projected body.
4. Define the terms amplitude, frequency and time period of a particle executing simple harmonic motion.
5. Define isothermal process and adiabatic process.
6. Mention any three conditions for a good auditorium.
7. Define angle of contact and capillarity.

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8. Write Poiseuille's formula for coefficient of viscosity and name the terms involved in it.
9. State Coulomb's inverse square law of magnetism. Write the equation for it.
10. Write any three applications of superconductors.

**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 dot product. 2  
 (b) Write any four properties of dot product. 4  
 (c) Find the work done by a force  $\vec{F} = 3\vec{i} + 5\vec{j} + \vec{k}$  which produces a displacement of  $\vec{S} = 2\vec{i} + \vec{j} + 4\vec{k}$ . 4
12. (a) Define acceleration due to gravity. 1  
 (b) Derive an equation for the height of a tower, when a body is projected vertically upwards from the top of the tower. 5  
 (c) A body is thrown up vertically with a velocity of 9.8 m/s from the top of a tower and reaches the ground in 4 seconds. Find the height of the tower. 4
13. (a) Define static, kinetic and rolling friction. 3  
 (b) State laws of friction. 3  
 (c) Derive expression for acceleration of a body on a rough horizontal surface. 4

14. (a) Write <sup>\*</sup> relation between kinetic energy and momentum. 1
- (b) Derive the expression for kinetic energy of a body of mass  $m$  moving with a velocity  $v$ . 5
- (c) A gun fires 200 bullets per minute. If the mass of each bullet is 3 gm and velocity is 500 m/s, find the power of the gun. 4
15. (a) Derive an expression for the time period of oscillations of a simple pendulum. 6
- (b) A simple pendulum of length 0.5625 m has a period of 1.5 seconds. Find the length of the seconds pendulum. 4
16. (a) Show that  $C_p - C_v = R$ . 6
- (b) A gas at 13 °C has its temperature raised so that its volume is doubled, the pressure remaining constant. Calculate the final temperature. 4
17. (a) Write any two causes and four effects of noise pollution. 6
- (b) Write any four differences between musical sound and noise. 4
18. (a) State Kirchhoff's first and second laws. 4
- <sup>\*</sup> (b) Apply Kirchhoff's laws to Wheatstone bridge and obtain the formula for balancing condition. 6

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