



C09-A-103/C09-AA-103/C09-AEI-103/C09-BM-103/
C09-CH-103/C09-CHST-103/C09-FW-103/
C09-IT-103/C09-MET-103/C09-MNG-103/
C09-PKG-103/C09-TT-**103**

3003

**BOARD DIPLOMA EXAMINATION, (C-09)
OCT/NOV—2014
FIRST YEAR (COMMON) 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. Convert newton into dynes using dimensional method.
2. If $A = i + 3j + 2k$ and $B = i + j + 2k$, find $\vec{A} \cdot \vec{B}$.
3. A stone projected upwards with a velocity of 9.8 m/s from the top of a tower reaches the ground in 4 seconds. Find the height of the tower.
4. A cubical block rests on a plane of $1/\sqrt{3}$. Find the angle through which the plane is inclined to the horizontal so that the block just slides down.

- * 5. The time period of a simple pendulum is 1.5 s. If its length is increased four times, find the time period.
6. What is gas constant? Does it have the constant value for all gases?
7. Define echo. Write any two applications of echo.
8. Define surface tension. State its SI unit.
9. Define magnetic induction field strength and state its SI units.
10. Briefly explain different types of optical fiber.

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) State parallelogram law of vectors. Draw figure. 4
 (b) Using parallelogram law, find the magnitude and direction of the resultant, where the angle between the two vectors is
 (i) 0 and (ii) 180 . 6
12. (a) Show that path followed by an obliquely projected body is a parabola. 6
 (b) A football is projected with a velocity of 29.4 m/s at an angle of 30° to the horizontal. Find the maximum height reached by it and its range. 4
- * 13. (a) Define kinetic energy. Derive an expression for kinetic energy. 7
 (b) A body of mass 1 kg is allowed to fall from a height of 10 m from the ground. Calculate its potential energy and kinetic energy when the body is at a height of 6 m from the ground. 3

- * **14.** (a) Define the terms (i) time period, (ii) amplitude and (iii) phase of SHM. 3
- (b) Derive the expression for time period of a particle executing SHM. 4
- (c) A particle is performing SHM with an amplitude of 0.5 m and has an angular velocity 100 rad/s. Find the velocity at a distance of 0.3 m from the equilibrium position. 3
- 15.** (a) State and explain first law of thermodynamics. Discuss the application of first law to (i) isothermal process and (ii) adiabatic process. 6
- (b) The ratio of specific heats of a gas is 1.4. Its molar specific heat at constant pressure is 6.94 cal/mol/K. Find the value of universal gas constant. 4
- 16.** (a) Define musical sound and noise. 4
- (b) What are the methods to minimize noise pollution? 6
- 17.** (a) State Hooke's law. 2
- (b) Derive an expression for Young's modulus. 4
- (c) Calculate the force required to increase the length of a wire of cross-sectional area 10^{-6} m^2 by 50%, if the Young's modulus of the material of wire is $90 \times 10^9 \text{ Pa}$. 4
- * **18.** (a) Describe the construction of a meter bridge. Explain the method to find the resistivity of the material of a wire. 7
- (b) If the resistances in the left and right gaps of a meter bridge are in the ratio 2 : 3, find the balance length. 3
