* 3 0 0 3 *

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)

MARCH/APRIL—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. If the unit of length and force be increased 4 times, how does the unit of work increase?

2. If $\bar{a}$ $\bar{b}$ 0, then show that the angle between them is 90°.

3. Derive the expression for the time of flight of a body projected vertically upwards.

4. A body of mass 10 kg is projected up a smooth inclined plane of length 10 m with a velocity of 9 8 m/s. If the angle of projection of the plane is 30° with the horizontal, find the acceleration and the force required to move up the plane.

5. Write the expression for the time period of a simple pendulum and explain the terms involved.

6. What is meant by external work done by a gas? Write the expression for the external work.

7. Write any three applications of Doppler effect.

8. Define Young's modulus and bulk modulus.

9. The force between two short magnets is F, when the pole strengths are doubled and distance between the magnets is halved, what is the force between them?

10. What is an optical fiber? Name 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 the triangle law and parallelogram law of vectors with figures. 6

(b) Two equal vectors have a resultant equal to one of them. Find the angle at which they are inclined. 4

12. *(a)* Derive an expression for the magnitude and direction of resultant velocity of a body after any instant t in case of an oblique projection. 7

(b) The range of a projectile is twice its maximum height. Its velocity of projection is 10 m/s. What is the range of the projectile? (Take g 10 m / s^2.) 3

13. *(a)* Derive the relation between kinetic energy and momentum. 4

(b) Briefly explain the conventional and non-conventional sources of energy. 6

14. *(a)* Derive the expressions for velocity and acceleration of a particle executing SHM. 6

(b) The displacement of a particle in SHM is given by $y \quad 4 \sin (0 \ 2 \ t \quad / 6)$. Find *(i)* amplitude, *(ii)* frequency, *(iii)* time period and *(iv)* phase. 4

15. *(a)* State Charles' law at constant pressure and constant volume. 4

(b) Define absolute zero and write the relation between absolute temperature and centigrade scale. 3

(c) The pressure and volume of a gas at 30 °C are 750 mm and 550 cc respectively. Find the volume at 80 °C and 730 mm of pressure. 3

16. *(a)* Distinguish between musical sound and noise. 4

(b) Write any six effects of noise pollution. 6

17. *(a)* Define surface tension. Briefly explain any two illustrations of surface tension. 6

(b) Write the expression for the surface tension based on capillarity. Explain the terms. 4

18. *(a)* State and explain Kirchhoff's laws. 6

(b) Three currents 1 mA, 3 mA and i_3 mA are flowing towards the junction and two currents 2 mA and 3 mA are flowing out of the junction. Find the value of i_3. 4

★ ★ ★