* 6003 *

C16–A/AA/BM/CH/CHST/AEI/MET/
MNG/TT/IT/PCT—103

6003

BOARD DIPLOMA EXAMINATION, (C–16)
OCT/NOV—2018
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. Write any three advantages of SI units.

2. Define scalar and vector quantities. Give one example for each.

3. Define a projectile. Give two examples.

4. The displacement of a particle executing SHM is given by

$$y = 8\sin\left(2t - \frac{\pi}{4}\right).$$

Find the initial phase, angular velocity and amplitude.

5. Write any three differences between isothermal and adiabatic processes.

6. Write any three applications of beats.

7. Define stress and state Hooke's law.

8. Define surface tension. Give one example.

9. Define specific resistance and write its SI unit.

10. State the laws of photoelectric emission.

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 parallelogram law of vectors. Derive the expression for the magnitude of resultant. 6

(b) Find the dot-product of two vectors if $\vec{A}$ $2\vec{i}$ $5\vec{j}$ $7\vec{k}$ and $\vec{B}$ $3\vec{i}$ $8\vec{j}$ $4\vec{k}$. 4

12. *(a)* Show that the path of an oblique projectile is a parabola. 6

(b) A body is thrown up vertically up from the top of a tower with a velocity of 9 m/s. If it reaches the ground in 6 s, find the height of the tower. 4

13. *(a)* Define friction. List three types of friction. 2

(b) Derive an expression for the acceleration of a body projected up a rough inclined plane. 5

(c) Write any three advantages of friction. 3

14. *(a)* Define the terms work, power and energy. 3

(b) Derive the work-energy theorem. 3

(c) A machine gun fires 360 bullets per minute and each bullet travels with a velocity of 600 m/s. If the mass of each bullet is 5 g, find the power of the machine gun. 4

15. *(a)* State any four conditions of SHM. 4

(b) Derive the expression for time period of oscillations of a simple pendulum. 6

16. *(a)* Derive the relation $C_p \quad C_v \quad R$. 7

(b) The volume of certain mass of gas at 17 °C is 500 cm^3. Find the volume at 162 °C if the pressure is kept constant. 3

17. *(a)* Write any three applications of Doppler effect. 3

(b) Define noise pollution and write three effects of noise pollution. 1+3

(c) Write three methods to minimize noise pollution. 3

18. *(a)* State and explain Coulomb's inverse square law. 3

(b) Derive the expression for magnetic induction field strength at a point on axial line of a bar magnet. 7

★ ★ ★