



C16-EE-103/C16-CHPP-103

6036

BOARD DIPLOMA EXAMINATION, (C-16)

OCT/NOV—2017

DEEE—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 fundamental quantities and derived quantities. Give two examples each.

2. Define scalar and vector quantities. Give two examples each.

3. Define projectile. At which point on its path a projectile has the lowest speed?

4. The displacement of a particle performing SHM is  $y = 4 \sin(4t - \frac{\pi}{6})$  where  $y$  is metre. Find—

(a) amplitude

(b) initial phase

(c) time period

- \* 5. State the gas laws.
6. Write Sabine's formula and name the symbols in it.
7. Define surface tension. Give one example.
8. A load having mass 10 kg is suspended by a metal wire of certain length having a cross-sectional area of  $4 \text{ mm}^2$ . Find the stress.
9. State Ohm's law. Write the SI units of specific resistance.
10. Write any three applications of photoelectric effect.

**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 vector addition. 1
- (b) Derive the expression for the magnitude of the resultant vector. 5
- (c) Two vectors have magnitudes 3 unit and 4 unit respectively. What should be the angle between them if the magnitude of the resultant is 7 unit? 4
12. (a) Define acceleration due to gravity. 1
- (b) Show that the path of a horizontally projected body is a parabola. 5
- (c) A ball is thrown from a field with a speed of 20 m/s at an angle of  $45^\circ$  with the horizontal. At what distance will it hit the field again? Take  $g = 10 \text{ m/s}^2$ . 4

- \* 13. (a) Define friction. 1
- (b) Derive the expression for acceleration of a body moving down a rough inclined plane making an angle  $\theta$  with the horizontal. Let  $\mu$  be the coefficient of friction. 5
- (c) In a children-park an inclined plane is constructed with an angle of incline  $45^\circ$ . Find the acceleration of a boy sliding on it if the coefficient of friction between the cloth of the boy and the incline is 0.6 and  $g = 10 \text{ m/s}^2$ . 4
14. (a) Define work, power and energy. 3
- (b) State the law of conservation of energy. 1
- (c) Prove the law of conservation of energy in the case of freely falling body. 6
15. (a) Derive the expression for displacement and velocity of a particle executing SHM. 3+3
- (b) Calculate the length of the seconds pendulum at a place where the value of  $g$  is  $9.8 \text{ ms}^{-2}$ . 4
16. (a) Define isothermal process and adiabatic process. 2
- (b) Derive the gas equation  $PV = RT$ . 5
- (c) The volume of certain mass of air at  $17^\circ\text{C}$  is  $500 \text{ cm}^3$ . Find its volume at  $162^\circ\text{C}$  if the pressure is kept constant. 3
- \* 17. (a) Define noise pollution and write any four effects of it. 1+4
- (b) State any five methods of controlling of noise pollution. 5
18. (a) Define conductance and write its SI unit. 2
- (b) Derive the expression for couple acting on a bar magnet placed in a uniform magnetic field. 5
- (c) Two magnetic poles each of strength  $40 \text{ Am}$  are separated in air by a distance of  $0.2 \text{ m}$ . Find the force between them ( $\mu_0 = 4\pi \times 10^{-7} \text{ H/m}$ ). 3

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