4042

BOARD DIPLOMA EXAMINATION, (C–14)
OCT/NOV—2015
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. Write any three advantages of SI system of units.

2. State and explain triangle law of vectors.

3. A stone is projected vertically upwards from the top of a tower with a velocity of 9·8 m/s. It reached the ground after 6 s. What is the height of the tower (g 9 8 m / s^2)?

4. Define the following terms in SHM :

(a) Amplitude

(b) Time period

(c) Phase

5. 2000 J of heat is given to a gas, when its volume increases by 3 10^{-3} m^3 at a constant pressure of 10^5 Pa. What is the increase in the internal energy of the gas?

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6. Write Sabine's formula for reverberation time and explain the terms involved.

7. What is the effect of temperature on viscosity of liquids and gases?

8. Define capillarity and give two examples.

9. Define magnetic moment and magnetic induction field strength.

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)* Define scalar product and vector product of two vectors. Write two examples for each.   6

(b) Two forces of magnitudes 30 N and 40 N are acting on a body perpendicular to each other. Find resultant force both in magnitude and direction.   4

12. *(a)* Derive the expression for maximum height and horizontal range of a projectile in oblique projection.   6

(b) When a body is projected, if the maximum height reached and horizontal range are equal, what would be the angle of projection?   4

13. *(a)* Define coefficient of friction and angle of repose.   3

(b) Explain any four methods to minimize the friction.   4

(c) A body is sliding down on a rough inclined plane which makes an angle 45° with the horizontal. Calculate the acceleration of a body, if coefficient of friction   0 2.   3

14. *(a)* Define potential energy and give one example. 2

(b) Derive the expression for kinetic energy of a body of mass m and moving with a velocity v. 4

(c) A body falling from a height of 10 m bounces from a hard floor. How much height will it rise, if it loses 20% of its energy after impact? 4

15. *(a)* Derive the expression for time period of simple pendulum. 6

(b) A body executes SHM with amplitude of 0·5 m and time period 3·14 second. Find the velocity of the body when the displacement of 0·4 m from its mean position. 4

16. *(a)* Show that C_p C_v R. 6

(b) Calculate the value of universal gas constant R for one gram mole of gas at NTP. 4

17. *(a)* What is noise pollution? Mention any four sources of noise pollution. 6

(b) Write any four applications of Doppler effect. 4

18. *(a)* State Kirchhoff's laws of electricity. 4

(b) Derive an expression for magnetic induction field strength at a point on the axial line of bar magnet. 6

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