



C16-C/CM-103

6018

BOARD DIPLOMA EXAMINATION, (C-16)

OCT/NOV—2017

DCE—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 the dimensional formulae of the following :

(a) Universal gas constant

(b) Force

(c) Stress

2. State triangular law of vectors and explain.

3. A body is falling freely from a height of 78.4 m. Find the velocity of the body on reaching the ground. The value of g is 9.8 m/s^2 .

4. State the conditions of simple harmonic motion.

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

6. Write any three applications of Doppler effect.

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7. Write the ^{*}Poiseuille's equation for the coefficient of viscosity and name the symbols involved.
8. Define the terms 'stress' and 'strain'.
9. State Kirchhoff's laws.
10. Write three properties of superconductors.

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 dot product. 2
 (b) Mention any four properties of dot product. 4
 (c) Find the area of parallelogram formed by two vectors $P = \hat{i} + 2\hat{j} + 3\hat{k}$ and $Q = \hat{i} + \hat{j} + \hat{k}$ as two adjacent sides. 4
12. (a) Define projectile and give one example. 2
 (b) Show that the path of a projectile is a parabola in the case of oblique projection. 5
 (c) The range of projectile is equal to maximum height reached, find the angle of projection. 3
13. (a) Explain any three methods of reducing friction. 3
 (b) Derive the expression for the acceleration of a body slides down on a rough (with friction) inclined plane. 4
 (c) Find the force of friction on a body of mass 100 kg when it is just start sliding on horizontal surface if $\mu = 0.5$. The value of g is 9.8 m/s^2 . 3

- 14.** (a) State the law of conservation of energy and prove it in the case of freely falling body. 6
- (b) An engine is used to lift water from a well 60 m deep to fill a tank of dimensions 5 m × 5 m × 10 m in 40 minutes. Find the power of the engine if 30% energy is wasted. Take g as 9.8 m/s^2 . 4
- 15.** (a) Derive the equation for time period of a simple pendulum. 6
- (b) The displacement of a particle executing SHM is given by
- $$x = 4 \cos \left(2\pi t - \frac{\pi}{4} \right)$$
- All values are in S.I units.
- Find (i) amplitude (ii) angular velocity, (iii) maximum velocity and (iv) epoch. 4
- 16.** (a) What are the gas laws. Explain. 6
- (b) 15000 J of heat is given to a gas when its volume increased by 0.025 m^3 at a constant pressure $5 \times 10^5 \text{ Pa}$. Calculate increase in the internal energy of the gas. 4
- 17.** (a) Write any three differences between musical sound and noise. 3
- (b) Write any three effects of noise pollution and write any four measures to be taken to minimise the noise pollution. 7
- 18.** (a) Derive an expression for magnetic induction field strength at a point on the axial line of a bar magnet. 6
- (b) In the meter bridge experiment, if the resistance in the left and right gaps is in the ratio 3 : 4, find where the balancing point is obtained. 4
