



C14-M/CHOT/RAC-103

4051

BOARD DIPLOMA EXAMINATION, (C-14)

OCT/NOV—2015

DME—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) Answer should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Write three limitations of dimensional analysis.
2. The magnitude of cross product is equal to the dot product of two vectors. Find the angle between the two vectors.
3. Derive the expression for the horizontal range of a projectile in oblique projection.
4. Define simple harmonic motion and give two examples.
5. Distinguish between isothermal change and adiabatic change.
6. Define reverberation and reverberation time.
7. State Hooke's Law. Define stress and strain.

- * 8. Define viscosity and write two examples.
9. State and explain Coulomb's inverse square law of magnetism.
10. Write any three laws 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 vectors and derive the expression for the magnitude and direction of resultant vector in parallelogram law of vectors. 2+5
- (b) A force of 200 N is inclined at an angle of 60° to the vertical. Find the horizontal and vertical components. 3
12. (a) Show that the time of ascent is equal to time of descent in the case of vertically projected body. 6
- (b) A body is projected horizontally from a height of 176.4 m/s had a range of 450 m. Find the velocity of projection and time to reach ground. 4
13. (a) Derive the expression for acceleration and velocity at the bottom when a body is sliding down a rough inclined plane, with a neat diagram. 7
- (b) A force of 98 N is required to pull a body of mass 200 kg over ice. What is the coefficient of friction? 3
- * 14. (a) State and prove work-energy theorem. Derive equation for kinetic energy. 2+4
- (b) A machine gun fires 240 bullets per minute. Each bullet of mass 10 g and moving with a velocity of 400 m/s, then find the power of the machine gun. 4

- * 15. (a) Define ideal simple pendulum and derive expression for the time period of a simple pendulum. 1+6
 (b) The displacement of a particle in a Simple Harmonic Motion is given by the equation $y = 0.34 \sin(3000t + 0.74)$ in metre. Find initial phase, angular velocity and amplitude. 3
16. (a) Define first and second law of thermodynamics. 4
 (b) Derive $PV = RT$. 6
17. (a) Define noise pollution. Write any four effects of noise pollution. 2+4
 (b) Write any four differences between musical sound and noise. 4
18. (a) Derive the expression for the couple acting on a Bar magnet placed in a uniform magnetic field. 6
 (b) State and explain Kirchoff's laws in Electricity. 4
