



C14-M/CHOT/RAC-103

4051

BOARD DIPLOMA EXAMINATION, (C-14)

MARCH/APRIL—2017

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) Assume required data.

1. Write base quantities and their units in SI system.

2. If $\vec{A} = 4\vec{i} + 3\vec{j} + 6\vec{k}$ and $\vec{B} = \vec{i} + 3\vec{j} + 2\vec{k}$, find $\vec{A} \cdot \vec{B}$.

3. Write the equations of motion for a freely falling body.

4. Define amplitude, time period and frequency in SHM.

5. Write three differences between isothermal and adiabatic changes.

6. Define Doppler effect. Mention two examples.

7. Define stress and strain.

- * 8. Define coefficient of viscosity. Mention its SI unit.
9. State Kirchhoff's current law and write its mathematical form.
10. Define superconductor. Mention two applications.

PART—B

10×5=50

- Instructions :** (1) Answer *any five* questions.
 (2) Each question carries **ten** marks.
 (3) Assume required data.

11. (a) State parallelogram law of vectors. Derive the expression for the magnitude of the resultant vector. 6
 (b) Two equal forces 100 N each are acting at right angles. Find their resultant. 4
12. (a) Show that the path of a projectile is a parabola in oblique projection. 6
 (b) A warplane flying with a velocity of 100 m/s releases a bomb from a height of 490 m. Find when and where the bomb will strike the ground ($g = 9.8 \text{ m/s}^2$). 4
13. (a) State the laws of limiting friction. 4
 (b) Derive the expression for the acceleration of a body sliding down a rough inclined plane with neat diagram. 6
14. (a) Define work, power and energy. 3
 (b) Derive $PE = mgh$. 3
 (c) A person carries a rice bag of 100 kg to a height of 18 m in 5 minutes. Calculate the work done and power developed. 4
15. (a) State four conditions of SHM. 4
 (b) Derive the expressions for velocity and acceleration of a particle in SHM. 6

- * 16. (a) Derive ideal gas equation $PV = RT$. 6
(b) Calculate the value of universal gas constant at NTP. 4
17. (a) Define noise pollution. State four methods of control of noise pollution. 5
(b) State three conditions of a good auditorium. 3
(c) State two applications of beats. 2
18. (a) State Coulomb's law of magnetism and write its mathematical form. 3
(b) Draw Wheatstone bridge circuit and derive the formula for its balanced condition. 7
