C–14–CHOT/M/RAC–**103**

4051

BOARD DIPLOMA EXAMINATION, (C–14)
APRIL/MAY—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.

1. Write three limitations of dimensional analysis.

2. State triangle law of vectors and draw the diagram.

3. A body is falling freely from a height of 19·6 m. Find its velocity on reaching the ground.

4. If the length of a seconds pendulum is doubled, how does the time period change?

5. State the first law of thermodynamics and write the mathematical expression for it.

6. Define echo. Write any two applications of echo.

7. Define the terms 'stress', 'strain' and 'Hooke's law'.

8. Write the effect of temperature on viscosity of liquids and gases.

9. State Coulomb's inverse square law in case of magnetism and write the equation for the law.

10. Write three properties of superconductors.

PART—B 10×5=50

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

11. *(a)* Define law of parallelogram of vectors. Obtain an expression for the magnitude and direction of the resultant vector by the application of parallelogram law. 7

(b) The resultant of two vectors of 8N and 6N is 10N. Find the angle between them. 3

12. *(a)* Derive the expression for time of flight and horizontal range of a particle in oblique projection. 6

(b) A bullet is fired at an angle of 45° with the horizontal with a velocity of 49 m/s. Find the time of flight and horizontal range. 4

13. *(a)* Obtain an expression for the displacement and time taken of a body to come to rest on a rough horizontal surface. 7

(b) A body of mass 5 kg rests on a horizontal surface. If = 0·25, find the work done in moving the body through a distance of 1 m along the plane. 3

14. *(a)* Define work, power and energy. 3

(b) State and prove the law of conservation of energy in case of a freely falling body. 7

15. *(a)* Define SHM and give two examples. 3

    (b) Derive the formula for time period in case of simple pendulum. 7

16. *(a)* Prove that $C_P \quad C_V \quad R$. 6

    (b) Distinguish between isothermal and adiabatic processes. 4

17. *(a)* Define noise pollution. Mention any five of noise pollution. 7

    (b) Write any three applications of Doppler effect. 3

18. *(a)* Derive an expression for the magnetic induction field strength at a point on the axial line of a bar magnet. 7

    (b) Three currents 1 mA, 3 mA and i_3 mA are flowing towards the junction and two currents 2 mA and 3 mA are flowing away from the junction. Find the value of i_3. 3

★ ★ ★