C14–EC–103/C14–CHPC–103/C14–PET–**103**

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BOARD DIPLOMA EXAMINATION, (C–14)
MARCH/APRIL—2016
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 any three limitations of dimensional analysis.

2. Define scalars and vectors. State whether the following are scalars or vectors :

(a) Mass

(b) Velocity

3. Derive an expression for time of descent for a body in vertical motion.

4. The displacement of a particle in SHM formulated $y = 6 \sin\left(4t - \dfrac{\pi}{3}\right)$. Calculate its amplitude, angular velocity and time period.

5. In the gas equation $PV = RT$, what is R? Write ideal gas equation for n moles.

6. Write Sabine's formula and name its factors of influence.

7. Define surface tension and any two examples.

8. Write Poiseuille's expression for coefficient of viscosity of a liquid and write the dimensional formula for coefficient of viscosity.

9. The resistance of a wire is $8\ \Omega$, what is the resistance of the another wire of same material having same length but of double area of cross section?

10. What is an optical fiber? Name different types of optical fiber.

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PART—B 10×5=50

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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 vector product of two vectors. 2

(b) Write the properties of vector product. 4

(c) A force of 200 N is inclined at an angle 30° to the horizontal. Find the components in the vertical and horizontal directions. 4

12. *(a)* Show that the path of the horizontal projectile is parabola. 4

(b) A football is projected into air with velocity 10 m/s and angle 30° with the earth surface. Find its maximum height, time of ascent and range. Take $g = 10 \text{ m}/\text{s}^2$. 6

13. *(a)* Write any four methods to minimize friction. 4

(b) Define static friction, kinetic friction and rolling friction. 6

14. *(a)* State the law of conservation of energy. Write any two examples of it.   4

    (b) An engine lifts 4000 kg of water per minute from a wll 5 m depth If 20% energy is wasted, then find the power of the engine.   3

15. *(a)* Define the terms time period, frequency and amplitude.   3

    (b) Derive the expression for period of oscillation of a simple pendulum.   7

16. *(a)* Define the two molar specific heats of a gas.   3

    (b) Prove that C_p C_v R.   7

17. *(a)* State six methods of controlling noise pollution.   6

    (b) Define Doppler Effect and write its applications.   2+2=4

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

    (b) Derive formula for the moment of couple acting on bar magnet placed inside uniform magnetic field.   4

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