C16–C/CM–**103**

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BOARD DIPLOMA EXAMINATION, (C–16)
MARCH/APRIL—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) Velocity

     (b) Force

     (c) Frequency

2. Write three properties of scalar product.

3. Define projectile. Give two examples.

4. The simple harmonic motion of a body is given by the equation $y = 4 \sin\left(100t - \dfrac{\pi}{4}\right)$. Find *(a)* angular velocity, *(b)* time period and *(c)* initial displacement.

5. State first and second laws of thermodynamics.

6. Write three differences between musical sound and noise.

7. Define stress and strain. State Hooke's law.

8. Obtain Newton's formula for viscous force.

9. State and explain Coulomb's inverse square law of magnetism.

10. List three applications of optical fiber.

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)* Derive the expression for magnitude of resultant of two vectors using parallelogram law of vectors.   6

    (b) A force of 150 N acts on a particle at an angle of 30° to the horizontal. Find the horizontal and vertical components of force.   4

12. *(a)* Show that path of a projectile is a parabola in case of oblique projection.   6

    (b) A stone is projected with a velocity of 20 m/s at an angle of 30° to horizontal. After 1·5 seconds, find its horizontal distance and vertical height from its starting point.   4

13. *(a)* State any five advantages of friction.   5

    (b) A body is sliding down a rough inclined plane which makes an angle of 30° with the horizontal. Calculate the acceleration if the coefficient of friction is 0·25.   5

14. *(a)* Derive the expression for kinetic energy.   5

    (b) A machine gun fires 240 bullets per minute with a velocity of 500 m/s. If the mass of each bullet is 3 gm, find the power of the machine gun.   5

15. *(a)* Define simple harmonic motion. Give three examples. 5

(b) Derive an expression for velocity of a particle performing simple harmonic motion. Draw necessary diagram. 5

16. *(a)* Define the two molar specific heats of a gas. 4

(b) Derive the ideal gas equation. 6

17. *(a)* Define noise pollution. 2

(b) Write any four effects of noise pollution. 4

(c) State four applications of beats. 4

18. *(a)* Derive an expression for balancing condition of Wheatstone's bridge with neat circuit diagram. 6

(b) The values of resistance of *P*, *Q*, *R* are 50 ohms, 10 ohms, 15 ohms respectively in the balanced condition of the bridge. Find the unknown resistance *S*. 4

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