5003

BOARD DIPLOMA EXAMINATION, (C-16)

MARCH / APRIL - 2019

FIRST YEAR (COMMON) EXAMINATION

ENGINEERING PHYSICS

Time : **3** Hours]   [Total Marks : **80**

PART - A   2×15=30

Instructions :   (1) *Answer any* **15** *questions.*

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

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

1   Write dimensional formula for :

(i)   Work

(ii) Momentum

2   Write any two advantages of S.I Units.

3   Define unit vector and proper vector.

4   State whether the following quantities are scalars or vectors :

(i)   Density

(ii) Acceleration

5   What is a projectile? Give an example.

6   Write any two equations of motion for a freely falling body.

7   It is easier to roll a barrel than to slide it on a horizontal road. Explain.

8   State any two methods of reducing friction

9   Define potential energy. Give an example.

10   State any two conditions of simple harmonic motion (SHM).

11   The equation of a particle executing SHM is given by $y = 5 \sin \left(2\pi t + \pi / 4 \right)$ where all the quantities are in SI Units. Find the amplitude and phase constant.

12   Why is C_P greater than C_V? Explain.

13   Define absolute zero.

14   Write any two differences between musical sound and noise.

15   Write Sabine formula for reverberation time.

16   State Hooke's law.

17   Define surface tension. Give an example.

18   State Coulomb's inverse square law of magnetism.

19   Write any two characteristics of magnetic lines of force.

20   Write any two applications of super conductivity.

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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) Answer should be comprehensive and criterion for valuation is the content but not the length of the answer.

21   (a) State parallelogram law of vectors. Derive expression   **2+4** for the magnitude of the resultant.

        (b) Show that when two forces are equal in magnitude their   **4** resultant is equal to $2p\cos \left(\theta / 2 \right)$, where 'p' is one of the forces and 'θ' is the angle between them.

22 (a) Derive expression for maximum height and horizontal   3+3
          range of a projectile in oblique projection.

    (b) An airplane flying horizontally with a speed of 360 kmph   4
          releases a bomb at a height of 490 m from the ground. When
          and where will the bomb strike the ground?

23 (a) State work-energy theorem and prove it.   1+5

    (b) If the kinetic energy of a given particle is doubled how   4
          does its momentum change?

24 (a) Derive an expression for the time period of a simple   6
          pendulum.

    (b) State the laws of simple pendulum.   4

25 (a) State Boyle's law and derive the ideal gas equation.   1+5

    (b) Calculate the value of Universal gas constant.   4

26 (a) Explain the phenomenon of beats. Write any two   4+2
          applications of beats.

    (b) Derive a formula for minimum distance to hear a clear echo. 4

27 (a) Explain Wheat stone's bridge and derive the condition for   6
          balancing of the bridge.

    (b) Resistances of 2Ω and 3Ω are kept in the left   4
          and right gaps of a meter bridge respectively. Where should
          the jockey be placed on the wire measuring from the left end
          to get null deflection in the galvanometer.

28 (a) Explain the principle and working of optical fiber.   1+5

    (b) State the laws of photoelectric effect.   4

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