



C16-COMMON-103

6003

BOARD DIPLOMA EXAMINATION, (C-16)

JULY—2023

FIRST YEAR (COMMON) 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 formula of the following :
 - (a) Stress
 - (b) Density
 - (c) Work
2. A force of 50 N is acting on a body at an angle 30° with the horizontal. Find its horizontal and vertical components.
3. Derive an expression for the maximum height reached by a body thrown vertically upwards.
4. Write any three conditions of Simple Harmonic Motion.
5. Convert the following to Kelvin scale of temperature :
 - (a) 0°C
 - (b) -100°C
 - (c) 50°C

- * 6. List any three applications of Doppler effect.

- 7.* State Newton's formula for viscous force and name the physical quantities contained in it.
8. Define stress and strain.
9. State Ohm's law and write its formula.
10. List any 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 criterion for valuation is the content but not the length of the answer.

11. (a) Define Dot product of two vectors. Write any five properties of it. 7
 (b) Given are two vectors $\vec{A} = 2\vec{i} - 3\vec{j} + 4\vec{k}$ and $\vec{B} = \vec{i} + 2\vec{j} - 3\vec{k}$. Find $\vec{A} \cdot \vec{B}$. 3
12. (a) Derive an expression for the height of a tower when a body is projected vertically upwards from the top of a tower. 6
 (b) A stone is projected vertically upwards from the top of a tower with a velocity of $4.9 \frac{m}{s}$. It reached the ground after 6 seconds. Find the height of the tower. 4
13. (a) Derive an expression for the acceleration of a body sliding down on a rough inclined plane. 6
 (b) Write any four methods of minimizing friction. 4
14. (a) State and derive work-energy theorem. 7
 (b) Find the kinetic energy of a bullet of mass 15 g moving with a velocity of $400 \frac{m}{s}$. 3

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- 15.*** (a) State laws of motion of a simple pendulum. 3
(b) Derive an expression for the time period of a simple pendulum. 7
- 16.** (a) Write any four differences between isothermal and adiabatic processes. 4
(b) Calculate the value of Universal gas constant 'R'. 6
- 17.** (a) Write Sabine's formula and name the parameters contained in it. 6
(b) State any four acoustic conditions of a good auditorium. 4
- 18.** (a) Derive an expression for the balancing condition of Wheatstone's bridge. 7
(b) Three currents 2 mA, 4 mA, i_3 mA are flowing towards a junction and two currents 3 mA and 7 mA are flowing away from the same junction. Find the value of i_3 . 3

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