

7050

BOARD DIPLOMA EXAMINATION, (C-20)

MAY—2023

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

1. Write dimensional formula of the following physical quantities :
 - (a) force
 - (b) stress
 - (c) energy
2. State any three properties of dot product.
3. A body is projected vertically upwards with an initial velocity 19.6 m/s. Find time of flight of the body.
- * 4. State any three methods of reducing friction.
5. A body of mass 100 kg is lifted to height 10 m from the ground by a crane. Find the work done by the crane.
6. State any three conditions of SMM.
7. Define conduction convection and radiation modes of transmission of heat.
8. A boy hears echo of his own voice from a hill of distance 700 m from him in 4 seconds. Find the velocity of sound.
9. Define specific resistance. What is its SI unit?
10. State Coulomb's inverse square law of magnetism.

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PART—B

8×5=40

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **eight** 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 six properties of it. 2+6

(OR)

(b) Show that the path of a projectile in horizontal projection is parabola. 8

12. (a) Derive an expression for acceleration of a body sliding down on a rough inclined plane. 8

(OR)

(b) State and prove work-energy theorem. 2+6

13. (a) The displacement of a particle executing simple harmonic motion is given by $y = 5 \sin(2\pi t + \pi/6)$. All the quantities are in SI units. Find (i) maximum velocity (ii) maximum acceleration (iii) time period and (iv) initial displacement. 2+2+2+2

(OR)

(b) Define isothermal and adiabatic processes. State any four differences between isothermal and adiabatic processes. 4+4

14. (a) Define Doppler Effect. State any six applications of Doppler Effect. 2+6

(OR)

(b) Define coefficient of viscosity. Explain the effect of temperature on viscosity of liquids and gases. 2+6

15. (a) Define magnetic field. Write any six properties of magnetic lines of force. 2+6

(OR)

(b) Define superconductor and state any six properties of superconductors. 2+6

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PART—C

10×1=10

- Instructions :**
- (1) Answer the following question.
 - (2) The question carries **ten** marks.
 - (3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

16. Derive $C_p - C_v = R$ and hence, show that C_p is greater than C_v .

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