



C16-M/CHOT/RAC-103

6053

BOARD DIPLOMA EXAMINATION, (C-16)

MARCH/APRIL—2017

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 the dimensional formulae for the following physical quantities :
  - (a) Force
  - (b) Power
  - (c) Stress
2. State triangle law of vectors.
3. A stone is dropped from a balloon ascending with uniform vertical velocity of 23.2 m/s and reaches the ground in 10 s. Find the height of the balloon when the stone reaches the ground. Take the value of  $g$  as  $9.8 \text{ m/s}^2$ .
4. A particle is performing SHM with an amplitude of 0.5 m and has an angular velocity 1000 rad/s. Find its velocity at a distance 0.3 m from the mean position.

5. Define two molar specific heats of a gas.
6. Define echo and give two applications.
7. Define Hooke's law and angle of contact.
8. Write Newton's formula for viscous force. Name the symbols.
9. Define specific resistance and conductance.
10. Write any three applications of photoelectric effect.

**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) Define vector product and write properties of vector product. 6  
 (b) Two vectors  $A = 3i + aj + 3k$  and  $B = 3i + j + k$  are perpendicular to each other. Calculate the value of constant  $a$ . 4
12. (a) Show that the path is parabola in the case of body projected horizontally from the top of a tower. 6  
 (b) An object is thrown vertically up with initial velocity 39.2 m/s. 4
13. (a) Explain methods of reducing friction. 4  
 (b) Derive expression for acceleration of a body, sliding down on smooth inclined plane. 6
14. (a) State the law of conservation of energy and prove it in the case of a freely falling body. 7  
 (b) If the mass of a body is reduced to half and velocity is doubled, how does its KE change? 3

15. (a) Define <sup>\*</sup> second's pendulum. 2  
(b) Derive expression for displacement of a body in SHM. 5  
(c) Calculate the length of the second's pendulum at a place where the value of  $g$  is  $9.8 \text{ m/s}^2$ . 3
16. (a) State any five differences between isothermal process and adiabatic process. 5  
(b) Define absolute zero temperature. 2  
(c) One litre of air is heated from  $27^\circ\text{C}$  to  $177^\circ\text{C}$  at constant pressure. Find the increase in volume of the gas. 3
17. (a) Write any six causes for noise pollution. 6  
(b) Define beats and write two applications of beats. 4
18. (a) Explain 'Wheatstone bridge' and derive expression while bridge is balanced. 6  
(b) State Coulomb inverse square law of magnetism. 4

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