



C14-M-103/C14-CHOT-103/C14-RAC-103

4051

BOARD DIPLOMA EXAMINATION, (C-14)

MARCH/APRIL—2016

DME—FIRST YEAR EXAMINATION

ENGINEERING PHYSICS

Time : 3 hours ]

[ Total Marks : 80

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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 (a) latent heat, (b) momentum and (c) acceleration.
2. State triangle law of vectors. Draw a diagram for it.
3. Derive an expression for maximum height for a body projected vertically up.
4. Find the value of acceleration due to gravity at a place where the length of the seconds pendulum is 0.9 m.
5. Define (a) gas constant and (b) universal gas constant.
6. Write any three characteristics of musical sound.
7. Define surface tension. Write any one example of it.

- \* 8. Write the Newton's formula for viscous force and hence define coefficient of viscosity.
9. State the Kirchhoff's laws.
10. Define critical angle and total internal reflection.

**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 dot product of two vectors. 2  
 (b) Write any four properties of dot product. 4  
 (c) If a vector  $\vec{A} = 2\vec{i} + \vec{j} + 2\vec{k}$  and  $\vec{B} = 2\vec{i} + 3\vec{j} + 2\vec{k}$  are two adjacent sides of a parallelogram, find the area of parallelogram. 4
12. (a) Show that the path of a horizontally projected body is a parabola. 6  
 (b) A bullet is fired at an angle of  $45^\circ$  with horizontal with a velocity of 49 m/sec. Find the time of flight and horizontal range. 4
13. (a) Derive the expression for acceleration of a body moving down the rough inclined plane with diagram. 5  
 (b) Write any four advantages of friction. 5
14. (a) Define work done, power and energy. Write their SI units. 6  
 (b) An engine is used to lift water from a well 50 m deep to fill a tank of dimensions 5 m × 5 m × 10 m in 50 minute. Find the power of the engine. 4

- \* 15. (a) Derive the expression for velocity and acceleration in simple harmonic motion. 6
- (b) A particle executing SHM with a period of 10 seconds and amplitude 1.5 m. Calculate the maximum velocity. 4
16. (a) Prove  $C_p - C_v = R$ . 6
- (b) The volume of a gas is 20 c.c. at 27 °C. Pressure remaining constant. What is the temperature at which the volume of the gas is 40 c.c.? 4
17. (a) Define echo. 2
- (b) What is Doppler effect? Write any four applications of it. 6
- (c) Write Sabine's formula. 2
18. (a) State and explain Ohm's law. 4
- (b) Derive an expression for magnetic induction field strength ( $B$ ) at a point on the axial line of a bar magnet. 6

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