C16–M/CHOT/RAC–**103**

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BOARD DIPLOMA EXAMINATION, (C–16)
OCT/NOV—2018
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. Define the terms dimensions and dimensional formula.

2. Define cross-product of two vectors.

3. A body is allowed to fall freely from a height of 1000 m. Find the time taken to reach the ground (g　$10 \text{m} / \text{s}^2$)

4. State the laws of simple pendulum.

5. State the gas laws.

6. What is an echo? Define reverberation and reverberation time.

7. Define surface tension and give one example.

8. Write the Newton's formula for viscous force and name the terms in it.

9. State and explain Ohm's law.

10. Write any three applications of superconductors.

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PART—B

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10×5=50

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

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

(3) The answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. *(a)* State and explain triangle law and polygon law of vectors.

(b) Find the angle between the two vectors $\vec{A}$ $2\vec{i}$ $3\vec{j}$ $\vec{k}$ and $\vec{B}$ $2\vec{i}$ $3\vec{j}$ $5\vec{k}$.

12. *(a)* Derive the expression for height of a tower, when a body is projected vertically upwards from the top of the tower.

(b) A stone is thrown up vertically from the top of a tower with a velocity of 19.6 m/s. If it reaches the ground in 5s, find the height of the tower.

13. *(a)* List any methods of minimizing friction.

(b) Derive an expression for the acceleration of a body moving down on a smooth inclined plane.

(c) A body is sliding down a rough inclined plane at an angle 45° with the horizontal. Calculate the acceleration if   0.1414.

14. *(a)* Define potential energy and kinetic energy. Write one examples for each.

(b) Derive an expression for kinetic energy.

(c) A body of mass 15 kg is lifted against gravity to a height of 5m from the ground. Find the work done.

15. *(a)* Derive the expression for acceleration and time period of a particle executing simple harmonic motion.

(b) The acceleration of a particle in SHM is 8 units. When its displacement is 2 units, find its time period of oscillation.

16. *(a)* Define the two specific heats of gas.

(b) Write any four differences between isothermal and adiabatic processes.

(c) Calculate the value of universal gas constant (R) for one gram mole of a gas.

17. *(a)* Explain three sources of noise pollution and three effects of noise pollution.

(b) Write four conditions for a good auditorium.

18. *(a)* Write three properties of magnetic lines of force.

(b) Describe Metre bridge experiment to determine the unknown resistance with neat circuit diagram.

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