C16–M–103/C16–CHOT–103/C16–RAC–**103**

6053

BOARD DIPLOMA EXAMINATION, (C–16)
OCT/NOV—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. State the limitations of dimensional analysis.

2. Define scalars and vectors. Write one example for each.

3. Define acceleration due to gravity. Write its SI unit and dimensional formula.

4. Calculate the length of seconds pendulum at a place where $g = 9 \cdot 8 \, m/s^2$.

5. Write three differences between universal gas constant (R) and specific gas constant (r).

6. Write any three applications of echoes.

7. Define surface tension and give one example.

8. Define stress. Write its SI unit and dimensional formula.

9. Calculate the potential difference to be applied across a conductor of resistance 20 so that a current of 2 A may flow through it.

10. Write 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)* State parallelogram law of vectors and derive expressions for magnitude and direction of the resultant vector.   7

    (b) Find the magnitude of the vector $2\vec{i} \quad 3\vec{j} \quad 4\vec{k}$.   3

12. *(a)* Derive expressions for maximum height and time of flight of a body projected vertically upwards.   6

    (b) A stone is thrown vertically upwards from the ground with a velocity of 9 8 ms^{1}. Find the maximum height reached and time of ascent.   4

13. *(a)* Derive expressions for acceleration and time taken to come to rest for a body moving over a rough horizontal surface.   6

    (b) Explain two methods of reducing friction.   4

14. *(a)* State and prove the work-energy theorem.   6

    (b) A car of mass 1000 kg moving with a velocity of 10 ms^{1} is accelerated to 70 ms^{1}. Find the work done.   4

15. *(a)* State any four conditions of SHM. 4

(b) Derive expressions for velocity and acceleration of a particle performing SHM. 6

16. *(a)* Derive the ideal gas equation $PV = RT$. 7

(b) One litre of gas is heated from 27 °C to 127 °C at constant pressure. Find its final volume. 3

17. *(a)* Define noise pollution and write five effects of noise pollution. 1+5=6

(b) A boy hears an echo of his own voice from a distant hill after 2 seconds. Find the distance of the hill if the velocity of sound is 345 ms^{-1}. 4

18. *(a)* Derive expression for couple acting on a bar magnet in uniform magnetic field. 7

(b) A bar magnet of pole strength 40 A-m has a length 20 cm. Find the magnetic moment. 3

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