C16–C/CM–**103**

6018

BOARD DIPLOMA EXAMINATION, (C–16)

JUNE—2019

DCE—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 any three limitations of dimensional analysis.

2.   A force of 200 N is inclined at an angle 60° to the vertical. Find the horizontal and vertical components of the force.

3.   Obtain the expression for horizontal range of a projectile in oblique projection.

4.   The displacement of a body executing in SHM is $y = 5\sin\left(2\pi t + \dfrac{\pi}{6}\right)$.

Find its amplitude and time period. All values are in SI units.

5.   Write any three differences between gas constant and universal gas constant.

6.   Write any three methods for minimizing noise pollution.

7. Define stress and state Hook's law.

8. Write Newton's formula for viscous force and explain terms involved.

9. A balancing point in a meter bridge experiment is obtained at 30 cm from the left. If the right gap contains a resistance of 3·5 ohm, what is the resistance in the left gap?

10. List any three applications of optical fibres.

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 scalar product and vector product of two vectors.   4

(b) State and explain polygon law of vectors.   4

(c) The magnitude of vector product of two vectors is equal to the magnitude of their scalar product. What is the angle between them?   2

12. *(a)* Define oblique projection. Give one example.   2

(b) Show that the path of a projectile is a parabola in horizontal projection.   5

(c) A body falls from a height of 78·4 m. Find the velocity of the body and the time taken on reaching the ground. The value of g = 9·8 m/s^2.   3

13. *(a)* State any four laws of friction.   4

(b) Mention the advantages and disadvantages of friction.   6

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

(b) A body falling from a height of 10 m bounces off a hard floor. How much height will it rise if it loses 20% of its energy after impact?   4

15. *(a)* Define second's pendulum. Derive the expression for the time period of simple pendulum. 7

(b) A particle is performing SHM with an amplitude of 0·5 m and has an angular velocity 1000 rads^{-1}. Find its velocity at a distance of 0·3 m from its mean position. 3

16. *(a)* What is an ideal gas? Derive equation for ideal gas of *n* moles. 6

(b) State the first and second laws of thermodynamics. 4

17. *(a)* Write any three applications of beats. 3

(b) State any three conditions for good auditorium. 3

(c) Write any four effects of noise pollution. 4

18. *(a)* Explain Wheatstone's bridge and derive the condition for balancing the bridge. 6

(b) The magnetic moment of a short bar magnet is 27 Am^2. What is the magnetic induction field strength at a point 30 cm away on its equatorial line from its mid point? In vaccum, the value of $\mu o = 4\pi \times 10^{-7}$ H/m. 4

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