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C09–CM–103

3023

BOARD DIPLOMA EXAMINATION, (C–09)

MARCH/APRIL—2014

DCME—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 of the following :

(a) Momentum

(b) Modulus of elasticity

(c) Density

2. Explain the linear velocity as an example of vector product.

3. A football is projected with a velocity of 29·4 m/s at an angle of 30° to the horizontal. Find its time of flight.

4. State the methods of reducing friction.

5. The displacement of a particle in SHM is given by $y = 8\sin(20t - /3)$. Find the maximum velocity and epoch.

6. State Charles' constant pressure law and write its formula.

7. Write any three differences between musical sound and noise.

8. Define surface tension and write its formula based on capillarity.

9. Define specific resistance and state its SI unit.

10. Write the Einstein photoelectric equation and name the terms involved in the equation.

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. 2

(b) Using parallelogram law of vectors, find the magnitude and direction of the resultant when the angle between the two vectors is *(i)* 90 and *(ii)* 180 . 8

12. *(a)* Define acceleration due to gravity. 2

(b) Derive the expression for the height of a tower when a body is projected vertically upwards from the top of the tower. 4

(c) A stone is projected upwards from the top of a tower with a velocity of 9·8 m/s reaches the ground in 4 seconds. Find the height of the tower. 4

13. *(a)* Define kinetic energy. Mention its units and dimensional formula. 4

(b) Derive the expression for kinetic energy. 4

(c) A person carrying luggage on his head and moving in horizontal direction does no work. Explain. 2

14. State Kirchhoff's laws and derive an expression for the condition for balance of a Wheatstone's bridge. 4+6

15. *(a)* State the conditions of SHM. 4

(b) Derive the expressions for displacement and velocity of a body in SHM. 6

16. *(a)* Distinguish between isothermal and adiabatic processes. 4

(b) Derive the equation $C_p \quad C_v \quad R$. 6

17. *(a)* Explain the effects of noise pollution. 4

(b) What is Doppler effect? Write the applications of Doppler effect. 6

18. *(a)* Write the formulae of Young's modulus, rigidity modulus and bulk modulus. 6

(b) Derive Newton's formula for viscous force. 4

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