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7018

BOARD DIPLOMA EXAMINATION, (C-20)

MAY—2023

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.

Note : Take $g = 9.8 \text{ m/s}^2$ for solving numerical problems.

1. Write the dimensional formula of the following :
 - (a) Frequency
 - (b) Pressure
 - (c) Work
2. Two forces each of magnitude 1000 N are acting at right angles to each other. Find the resultant of the two forces.
3. Derive the expression for the maximum height reached by a body projected vertically upwards.
4. State any three laws of friction.
5. The kinetic energy of a body of mass 5 kg is given by 250 J. Find its momentum.
6. Write any three conditions of SHM.
7. Write any three differences between 'r' and 'R'.

8. Define echo. Write the formula for time of echo.
9. If 10 ohm and 30 ohm resistances are connected in left and right gaps in meter bridge experiment, find the balancing length from left terminal of the wire.
10. State Coulomb's inverse square law of magnetism. Write its formula.

PART—B

8×5=40

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **eight** marks.
(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. (a) State and explain parallelogram law of vectors with a new diagram. 8

(OR)

- (b) Derive an expression for the range of an oblique projectile. Find the maximum height reached by a body which is projected with a velocity of 19.6 m/s at an angle 30° to the horizontal direction.

4+4=8

12. (a) Define static friction and kinetic friction. Write any four factors that affect friction.

4+4=8

(OR)

- (b) Derive the relation between kinetic energy and momentum. A stone of mass 10 kg is falling freely from a height of 5 m above the ground. Find its kinetic energy on reaching the ground. 4+4=8

13. (a) Define displacement and amplitude in SHM. Derive an expression for the velocity of a body executing SHM.

2+6=8

(OR)

- (b) State first and second laws of thermodynamics. If a vessel containing 50 litres of a gas at 72 cm of mercury pressure which is connected to an evacuated vessel of 10 litres at constant temperature, find the resultant pressure.

4+4=8

14. (a) Write any three applications of beats. Write Sabine's formula for reverberation time and name the physical quantities contained in it. 3+5=8

(OR)

- (b) Define coefficient of viscosity. Write Newton's formula for viscous force. What is the effect of temperature on viscosity of liquids and gases? 2+2+4=8

15. (a) Derive an expression for the magnetic induction field strength at a point on the equatorial line of a bar magnet. 8

(OR)

- (b) State laws of photoelectric effect. Write any four applications of photoelectric effect. 4+4=8

PART—C

10×1=10

- Instructions :** (1) Answer the following question.
(2) The question carries **ten** marks.
(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

16. Derive an expression for the time period of simple pendulum and hence write your observations with reference to laws of simple pendulum. 7+3=10

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