C20-EC-CHPC-PET–103

7029

BOARD DIPLOMA EXAMINATION, (C-20)

JUNE/JULY—2022

DECE - 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 any three advantages of SI units.

2. Find the angle between the two vectors $\vec{A} = \hat{i} - 2\hat{j} + \hat{k}$ and $\vec{B} = 4\hat{i} - 2\hat{j} + 8\hat{k}$.

3. Define angular velocity and write its units.

4. Write any three methods to minimise friction.

5. Define the positive work done and negative work done with one example for each.

6. Define the terms amplitude, time period and frequency.

7. Define absolute zero. Write the relation between centigrade temperature and absolute temperature.

8. Write any three conditions for good auditoria.

9. A current of 2 A flows through a conductor of resistance 10 Ω. Find the potential difference produced across its two ends.

10. State and explain Coulomb's inverse square law in magnetism.

PART—B

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)* Define cross product of two vectors. Derive the expression for area of the parallelogram using cross product. 2+6

(OR)

(b) If a football is kicked into air with a velocity of 19.6m/s at an angle of 30° with horizontal. Find the maximum height reached and its range. 8

12. *(a)* Define angle of repose. Derive the condition for angle of repose on a rough inclined plane. 2+6

(OR)

(b) Derive the relation between momentum and kinetic energy. If the momentum of a body is doubled, how does energy change? 5+3

13. *(a)* If the displacement of a particle executing SHM is $y = 4 \sin (27\pi t + \pi/6)$ *m*, then find its amplitude, time period, frequency and angular velocity. 8

(OR)

(b) State gas laws and derive ideal gas equation. 3+5

14. *(a)* Distinguish between musical sound and noise. Write any four effects of noise pollution. 4+4

(OR)

(b) State Hooke's law. Write the units and dimensional formula of elastic constant. Mention different types of moduli of elasticity. 3+2+3

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

(OR)

(b) Define the terms superconductivity, transition temperature. Write any four applications of superconductors. 4+4

PART—C

Instructions : (1) Answer the following question.

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

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

16. Distinguish between isothermal process and adiabatic process. Apply first law of thermodynamics for the above two processes. 6+4

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