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C20-EC-CHPC-PET–103

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BOARD DIPLOMA EXAMINATION, (C-20)

SEPTEMBER/OCTOBER—2021

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. Define absolute error and relative error in measurements.

2. Define vector product of two vectors and give one example.

3. Define angular displacement and angular momentum and write their SI units.

4. List any three advantages of friction.

5. State the law of conservation of energy and give any two examples.

6. State the conditions of SHM.

7. The volume of a gas at 27 °C is 40 cc. Pressure remaining constant, find the temperature at which its volume becomes 80 cc.

8. Two notes of frequencies 525 Hz and 530 Hz are sounded together simultaneously. Find the number of beats produced per second.

9. State the Kirchhoff's laws of electricity.

10. State Coulomb's inverse square law of magnetism.

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 triangle law of vectors and find the angle between the two equal vectors have a resultant equal to either.

OR

(b) Show that the path of a projectile is parabola in oblique projection. A stone is projected upwards from the top of a tower with a velocity 20 ms^{-1} and it reaches the ground in 7 seconds. Find the height of the tower.

12. *(a)* Explain the methods to minimize the friction and find the work done in a dragging a body of mass 100 kg through a distance of 50 m on a level road if coefficient of friction $\mu = 0{\cdot}25$.

OR

(b) State and prove work-energy theorem and also derive the relationship between the kinetic energy and momentum.

13. *(a)* Derive an expression for the time period of simple pendulum and also state the laws of simple pendulum.

OR

(b) Distinguish between isothermal and adiabatic processes and state the first and second law of thermodynamics.

14. *(a)* Compare longitudinal and transverse wave motion and write the conditions for good auditorium.

OR

(b) Explain the effect of temperature on viscosity of liquids and gases, and define surface tension and capillarity and give two examples each.

15. *(a)* Derive an expression for the magnetic induction field strength at a point on the axial line of a bar magnet. An electric heater draws a current of 25 A from 120 V supply. What is its resistance?

OR

(b) Explain the principle and working of an optical fiber and write any three applications of superconductors.

PART—C

10×1=10

Instructions : (1) Answer the question.

(2) It carries **ten** marks.

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

16. For an ideal gas, show that the difference of molar specific heats (C_p and C_v) is equal to universal gas constant(R).

The molar specific heat of gas at constant volume is found to be 5 cal $mol^{-1}K^{-1}$. Find the ratio of molar specific heats (C_p and C_v) for the gas, if universal gas constant R = 2 cal $mol^{-1}K^{-1}$.

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