C20-COMMON-**103**

7003

BOARD DIPLOMA EXAMINATION, (C-20)
OCTOBER/NOVEMBER—2023

FIRST YEAR (COMMON) 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 for the following three physical quantities.

(a) Force

(b) Power

(c) Angular momentum

2. A force of 10 N is inclined at an angle of 30° with the horizontal. Find its horizontal and vertical components.

3. Define projectile. Give one example.

4. Define angle of repose. Write the relation between coefficient of friction and angle of repose.

5. A bullet of mass 10 g is fired from a gun with a velocity of 300 $m^1 s^{-1}$. Find its kinetic energy.

* 6. Define amplitude, time period and phase of a particle making S.H.M.

7. When an amount of heat energy 2000 J is supplied to a gaseous system at a constant pressure of 10^5 Pa, volume of that gas is increased by 3×10^{-3} m^3. Find the increase in internal energy of the gas.

8. Write any three applications of beats.

9. Define specific resistance of a conductor. Write the formula for it.

10. Write any three properties of magnetic lines of force.

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PART—B   8×5=40

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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 dot product of two vectors. Write any six properties of dot product.   2+6

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(OR)

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(b) Show that the time of ascent is equal to the time of descent for a body thrown vertically upwards.   8

12. *(a)* Derive the expression for acceleration of a body moving up on a rough inclined plane.   8

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(OR)

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(b) State and prove work-energy theorem.   2+6

13. *(a)* The equation for displacement of a particle making S.H.M. is $y = 8\sin\left(2\pi t + \dfrac{\pi}{4}\right)$. Find its initial phase, initial displacement, angular velocity and amplitude.   2+2+2+2

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(OR)

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(b) Explain isothermal process and adiabatic process.   4+4

14. *(a)* Define echo and reverberation. Write Sabine formula for reverberation time and frame the parameters in it. 4+6

(OR)

(b) Define Surface tension and viscosity. Explain the effect of temperature on viscosity of liquids and gases. 4+6

15. *(a)* Derive an expression for the moment of couple on a bar magnet placed in a uniform magnetic field. 8

(OR)

(b) Define superconductivity and critical temperature. Write any four applications of super conductors. 4+4

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 the relation $C_P - C_V = R$ and hence show that C_P is greater than C_V.

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