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C14-A/AA/AEI/BM/CH
CHST/C/CM/EC/EE/CHPP/CHPC/
CHOT/PET/M/RAC/MET/MNG

/IT/TT/PCT–**103**

4003

BOARD DIPLOMA EXAMINATION, (C–14)
MARCH/APRIL—2018
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 any three applicatons of dimensional analysis.

2. Find the dot product of the two vectors
$\vec{A} = 2\vec{i} + 3\vec{j} + 4\vec{k}$ and $B = \vec{i} - 2\vec{j} + \vec{k}$.

3. Define projectile and write two examples.

4. Write any three conditions of SHM.

5. State Boyle's law. Write the equation in terms of density of gas.

6. State Sabine's formula for reverberation time. Name the symbols in it.

7. Define stress and strain. State their SI units.

8. Write the Poiseuille's equation for coefficient of viscosity. Name the terms in it.

9. State the Kirchhoff's 1st and 2nd law.

10. Draw a neat sketch of photoelectric cell.

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 evaluation is the content but not the length of the answer.

11. *(a)* State cross product of two vectors. 2
(b) Write any four properties of cross product. 4
(c) If $\vec{A} = \vec{i} + 3\vec{j} + 2\vec{k}$ and $B = \vec{i} - \vec{j} + 2\vec{k}$. form two sides of a triangle, find the area formed by them. 4

12. *(a)* Prove that path of a projectile is parabola in oblique projection. 6
(b) A bullet is fired at an angle of 30° with horizontal with a velocity of 49m/sec. Find *(i)* maximum height and *(ii)* time of flight. 4

13. *(a)* Write any four methods to reduce fiction. 4
(b) Derive an expression for acceleration of a body moving up on a rough inclined plane. 6

14. *(a)* State and prove law of conservation of energy in case of a freely falling body. 7
(b) A body of 10kg is dropped from a height of 5m. What is its kinetic energy when it is just before reaches the ground? 3

15. *(a)* Derive the expression for (i) displacement and (ii) velocity of a body in SHM. 7

(b) A simple harmonic motion is given by the equation $Y = 8\sin\left(2\pi t + \frac{\pi}{4}\right)$. Find initial displacement, angular velocity and amplitude. 3

16. *(a)* Define two molar specific heats of a gas. 4

(b) Prove $C_P - C_V = R$. 6

17. *(a)* Define echo. State any four conditions of a good auditorium. 6

(b) Write any four applications of Doppler effect. 4

18. *(a)* Derive an expression for magnetic induction field strength (B) at a point on the axial line of a bar magnet. 6

(b) Find the magnetic induction at a distance 20 cm in air on the equatorial line of a bar magnet with magnetic moment 60 a-m^2. 4

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