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C16–A/AA/BM/CH/CHST/AEI/MET/
MNG/TT/IT/PCT—103

6003

BOARD DIPLOMA EXAMINATION, (C–16)
OCT/NOV—2017
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 three applications of dimensional analysis.

2. Two forces 8N and 6N are acting at a point with an angle of 90° between them. Find the resultant force.

3. A stone is projected vertically upwards from the top of a tower with a velocity of 4·9 ms ^{1}. If it reaches the ground after 5 seconds, find the height of the tower.

4. State the laws of simple pendulum.

5. State the gas laws.

6. Define reverberation and write Sabine's formula for reverberation time.

7. Define viscosity. Write the Poiseuille's equation for coefficient of viscosity of a liquid.

8. Define elasticity. State Hooke's law.

9. Three currents 1mA, 3 mA and i mA are flowing towards the junction and two currents 2 mA and 3 mA are flowing away from the junction. Find the value of i.

10. Write any three properties of superconductors.

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

11. *(a)* State the triangle law of addition of vectors and draw the diagram for it. 3

(b) Find the dot product of the vectors $\vec{P}$ $2\vec{i}$ $5\vec{j}$ $7\vec{k}$ and $\vec{Q}$ $3\vec{i}$ $8\vec{j}$ $4\vec{k}$. 3

(c) A force 200 N is acting on a body at an angle of 60° to the horizontal. Find the horizontal and vertical components of force. 6

12. *(a)* Show that path of the projectile is parabola in the case of oblique projection. 4

(b) A bullet is projected at an angle 30° to the horizontal with a velocity of 196 m/s. Find its vertical displacement and horizontal displacement after 10 seconds. 4

13. *(a)* State the laws of limiting friction. 4

(b) Write any four advantages of friction. 4

(c) A body is sliding down along an inclined plane which makes an angle of 30° with the horizontal. Calculate the acceleration if the plane is smooth. 2

14. *(a)* State and prove the work-energy theorem. 6

(b) Define kinetic energy and potential energy. Give two examples each. 4

15. *(a)* Define ideal simple pendulum. Derive the expression for its time period of oscillations. 1+6

(b) Write any three conditions of simple harmonic motion. 3

16. *(a)* Prove that $C_p \quad C_v \quad R$. 6

(b) A gas at 10^6 Nm ^{2} pressure expands adiabatically and its volume becomes 4 times of its initial volume. Find the final pressure of the gas if 1 4. 4

17. *(a)* Write four differences between musical sound and noise. 4

(b) Define Doppler effect and write four applications of it. 6

18. *(a)* Write any three characteristics of magnetic lines of force. 3

(b) Derive the Wheatstone's bridge principle using Kirchhoff's laws with necessary diagram. 7

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