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 $C_p - C_v = R$. 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 $\gamma = 1.4$. 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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