6053

BOARD DIPLOMA EXAMINATION, (C–16)
MARCH/APRIL—2018
DME—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. Write any three advantages of SI units.

2. A force of 200 N is inclined at an angle of 30° to the horizontal. Find the components in the horizontal and vertical directions.

3. Derive the expression for time of ascent in vertical projection.

4. Define SHM and give two examples.

5. State the gas laws.

6. Write any three applications of Doppler effect.

7. Define stress, strain and state Hooke's law.

8. Write Poiseuille's equation for coefficient of viscosity and name the symbols.

9. State and explain Coulomb's inverse square law of magnetism.

10. State any three laws of photoelectric effect.

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)* Define dot product and write three properties of dot product. 1+5

(b) Find the area of the parallelogram formed by the vectors $\vec{A} \; 2\vec{i} \; \vec{j} \; 2\vec{k}$ and $\vec{B} \; 2\vec{i} \; 3\vec{j} \; 2\vec{k}$ as adjacent sides. 4

12. *(a)* Show that the path of projectile is a parabola in horizontal projection. 6

(b) an aeroplane flying horizontally with a speed of 270 kmph releases a body at a height of 490 m from ground. Find when and where the body strikes the ground. 4

13. *(a)* Derive the expression for acceleration of a body sliding down on a rough inclined plane. 6

(b) A body is sliding down on a rough inclined plane which makes an angle of 30° with the horizontal. Calculate the acceleration, if 0 1. 4

14. *(a)* Define potential energy and kinetic energy and give two examples for each. 4

(b) Derive an expression for kinetic energy. 6

15. *(a)* Derive the expression for time period of oscillations of a simple pendulum. 7

(b) Find the value of g where the length of seconds pendulum is 0·9 m. 3

16. *(a)* Distinguish between isothermal and adiabatic processes. 4

(b) Derive the equation $C_p \; C_v \; R$. 6

17. *(a)* Define longitudinal and transverse waves. 4

(b) Define noise pollution and write any four methods of controlling noise pollution. 2+4

18. *(a)* Derive the balancing condition of Wheatstone's bridge with necessary circuit diagram. 7

(b) In a Wheatstone's bridge circuit Q 3 , R 4 and S 6 . Find the resistance P required to balance the bridge. 3

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