4035

BOARD DIPLOMA EXAMINATION, (C–14)
OCT/NOV—2016
DECE—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 three limitations of dimensional analysis.

2. A force of 50 N is acting on a body at an angle of 30° to the horizontal. Find its horizontal and vertical components.

3. Define projectile and give examples.

4. State the laws of simple pendulum.

5. Define absolute zero and write the relation between absolute temperature and centigrade temperature.

6. Write any three differences between musical sound and noise.

7. Define stress and strain. State Hooke's law.

8. Define angle of contact and write the formula for surface tension based on capillarity.

9. Define magnetic induction field strength and write its SI unit.

10. Write any three applications of superconductivity.

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PART—B   10×5=50

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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 vector product. Mention any five properties of vector product.   2+5

    (b) Find the vector product of two vectors $\vec{A} \quad 2\vec{i} \quad 3\vec{j} \quad 4\vec{k}$ and $\vec{B} \quad \vec{i} \quad 6\vec{j} \quad 5\vec{k}$.   3

12. *(a)* Derive the expression for height of a tower when a body is projected vertically upwards from the top of a tower.   6

    (b) An aeroplane flying horizontally with a speed of 360 km/hr releases a bomb at a height of 490 m from the ground. When and where will the bomb strike the ground?   4

13. *(a)* Obtain an expression for the displacement and time taken for a body to come to rest on rough horizontal surface.   6

    (b) A body is sliding down a rough inclined plane which makes an angle of 30° with the horizontal. Calculate the acceleration if the coefficient of friction is 0·25.   4

14. *(a)* Define work, power and energy, and write their SI units.   6

    (b) A man weighing 80 kg lifts a weight of 20 kg to the top of a building of 30 m height in 131 seconds. Find the work done and the horsepower.   4

15. *(a)* Derive the formula for time period in case of simple pendulum.   7

(b) The acceleration of a particle executing SHM is $0 \cdot 09$ m/s^2 at a displacement of $0 \cdot 25$ m from the mean position. Find the time period.   3

16. *(a)* State gas laws.   3

(b) Derive the ideal gas equation.   5

(c) Why is universal gas constant same for all gases?   2

17. *(a)* Define Doppler effect.   2

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

(c) State the conditions of good auditorium.   4

18. *(a)* State Ohm's law and define specific resistance.   4

(b) Describe meter bridge with a legible sketch.   6

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