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BOARD DIPLOMA EXAMINATION, (C–16)
MARCH/APRIL—2017
DCE—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 advantages of SI units.

2. A force is acting on a body making an angle 60° to the horizontal. The value of vertical component is 150 N. Find the actual force and horizontal component of force.

3. Define time of flight and range of a projectile.

4. State three conditions of simple harmonic motion.

5. State Charles' 1st law and 2nd law. What is the boiling point of water on Kelvin scale?

6. List three applications of Doppler effect.

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

8. Define surface tension. Write its SI unit.

9. State Ohm's law. Draw a neat sketch of Wheatstone's bridge indicating the directions of current flowing in different parts of the circuit.

10. State the laws of photoelectric effect.

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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 dot product of two vectors. Express work done by a force as dot product. 2+2

(b) Two forces 30 N and 40 N act at a point simultaneously at right angles to each other. Find the magnitude and direction of the resultant. 6

12. *(a)* Derive an expression for the height of a tower when a body is projected vertically upwards from the top of the tower with a velocity u and reaches the foot of the tower in a time t. 5

(b) A stone is thrown vertically up with a velocity of 19·6 m/s from the top of a building. If it reaches the ground in 6 seconds, find the height of the building. 5

13. *(a)* Define normal reaction. 2

(b) State the laws of friction. 4

(c) What is the work done in dragging a body of mass 200 kg through a distance of 80 m on a level road, if the coefficient of friction is 0·25? 4

14. *(a)* Verify the law of conservation of energy in case of a freely-falling body. 6

(b) A body of mass 100 kg is allowed to fall from a height of 50 m from the ground. Calculate its potential and kinetic energy at a height of 30 m from the ground. 4

15. *(a)* State the laws of simple pendulum. 3

(b) Derive the expression for the time period of oscillations of a simple pendulum with necessary diagram. 7

16. *(a)* State Boyle's law. 2

(b) Write four differences between isothermal and adiabatic processes. 4

(c) A cylinder contains 90·3 cc of gas at 17 °C and 735 mm pressure. Find its volume at NTP. 4

17. *(a)* Write any four methods to control noise pollution. 4

(b) State the conditions of a good auditorium. 4

(c) A boy hears an echo of his own voice from a distant hill after 2 seconds. If the velocity of sound is 340 m/s, what is the distance of the hill from the boy? 2

18. *(a)* Define magnetic moment and magnetic induction field strength. 4

(b) Derive the expression for moment of couple on a bar magnet placed in a uniform magnetic field. 6

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