6003

BOARD DIPLOMA EXAMINATION, (C-16)

MARCH/APRIL—2021

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.   State any three advantages of SI units.

2.   Define the following :

(a) Unit vector

(b) Proper vector

(c) Negative vector

3.   Write the equations of motion of a body moving with uniform acceleration.

4.   State the laws of simple pendulum.

5.   Write any three differences between specific gas constant and universal gas constant.

6. State any three methods of minimizing noise pollution.

7. State Newton's law of viscocity. What are the SI units of co-efficient of viscosity?

8. Define capillarity. Write formula for surface tension based on capillarity.

9. State and explain Ohm's law.

10. Write any three applications of optical fibers.

PART—B
10×5=50

Instructions : (1) Answer *any five* questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. *(a)* State any six properties of scalar product. 6

(b) Two vectors $\vec{A} = 2\hat{i} + \hat{j} - 2\hat{k}$ and $\vec{B} = 2\hat{i} - 3\hat{j} + 2\hat{k}$ are represented by two adjacent sides of a parallelogram. Find the area of the parallelogram. 4

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

(b) A ball is thrown vertically upwards from the top of a building with velocity 9·8 m/s and it reaches the ground in 3 seconds. Find the height of the building. 4

13. *(a)* Derive expression for acceleration of a body while moving upwards on a rough inclined plane. 6

(b) State any four laws of static friction. 4

14. *(a)* Define kinetic energy and derive expression for kinetic energy. 6

(b) If kinetic energy of a body is made 9 times of the initial value, keeping its mass constant, how many times does the momentum change? 4

15. *(a)* Derive expressions for velocity and acceleration of a particle executing simple harmonic motion. 6

(b) Find the length of seconds pendulum at a place where g = 9·78 m/s^2. 4

16. *(a)* Derive the ideal gas equation, PV = nRT. 6

(b) On supplying 1800 J of heat energy to a gaseous system its volume increases by $5{\times}10^{-3}$ m^3 at constant pressure $2{\times}10^5$ N/m^2. Calculate the increase in internal energy of the system. 4

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

(b) Define echo. Write four methods to minimize echoes. 6

18. *(a)* Derive the expression for magnetic induction field strength at a point on axial line of a bar magnet. 6

(b) Two resistances 20 Ω and 30 Ω are connected in left and right gaps of a meter bridge. Find the balancing length. 4

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