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**C16-EC/CHPC/PET-103**

**6029**

**BOARD DIPLOMA EXAMINATION, (C-16)**

**SEPTEMBER/OCTOBER - 2020**

**DECE—FIRST YEAR EXAMINATION**

**ENGINEERING PHYSICS**

*Time : 3 hours ]*

*[ Total Marks : 80*

**PART—A**

$3 \times 10 = 30$

**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 the dimensional formulas of the following physical quantities :
  - (a) Energy
  - (b) Strain
  - (c) Linear momentum
2. State and explain triangle law of forces with a neat diagram.
3. Derive the expression for maximum height reached by a body projected vertically upwards from the ground.
4. If  $y = 3 \sin \frac{2}{3}t \text{ m}$  is the equation for displacement in SHM, then find the amplitude, maximum velocity and time period.
5. Define specific heats at constant pressure and at constant volume. Write the relation between them.

- 6.** Write Sabine's formula for reverberation time and also explain the terms in it with units.
- 7.** What is capillarity? Write any two examples of capillarity.
- 8.** State and explain Newton's formula for viscous force.
- 9.** In a Wheatstone's bridge  $P = 3$ ,  $Q = 5$  and  $S = 6$ , what is the resistance required to balance the bridge?
- 10.** Write the applications of superconductors.

### PART—B

$10 \times 5 = 50$

- 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) Define scalar product. Write any five properties of scalar product. 7  
 (b) A force  $F = 4\hat{i} + 3\hat{j} - 2\hat{k}$  produces a displacement of  $S = 2\hat{i} + 4\hat{j} + 5\hat{k}$ . Find the work done. 3
- 12.** (a) What is a projectile? Write any two examples of projectile. 4  
 (b) Show that the path of the projectile in oblique projection is a parabola. 6
- 13.** (a) Derive the expression for acceleration of a body moving down on a rough inclined plane. 6  
 (b) Write any four methods of reducing friction. 4
- 14.** (a) Derive the relation between momentum and kinetic energy. 3  
 (b) Define potential energy and write any two examples for potential energy. 3  
 (c) A body of mass 3 kg is dropped from a height of 10 m. Find the potential and kinetic energies when at a height of 7 m. 4

- 15.** (a) Define the terms ‘amplitude’, ‘time period’, ‘frequency’ and ‘length of the pendulum’ with units. 6
- (b) A particle is in SHM with acceleration  $0\ 64\text{ m/s}^2$  and displacement  $0\cdot04\text{ m}$ . What is its time period? 4
- 16.** (a) Distinguish between isothermal and adiabatic processes. 6
- (b) A gas is compressed adiabatically so that the volume becomes  $1/3$  of the initial volume. If the initial pressure is one atmosphere, find the final pressure. (Given,  $\gamma = 1\cdot4$ ) 4
- 17.** (a) Explain the phenomenon of beats with neat diagram. 4
- (b) Write any six conditions for good auditoria. 6
- 18.** (a) Write any four properties of magnetic lines of force. 4
- (b) Derive the expression for moment of couple acting on the bar magnet. 6

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