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C14–EC–103/CHPC/PET–**103**

# 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.

## PART—B

10×5=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 vector product. Mention any five properties of vector product. 2+5

*(b)* Find the vector product of two vectors $\vec{A}$ $2\vec{i}$ $3\vec{j}$ $4\vec{k}$ and $\vec{B}$ $\vec{i}$ $6\vec{j}$ $5\vec{k}$. 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 0·09 $m/s^2$ at a displacement of 0·25 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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