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C–14–CHPP/EE–**103**

# 4042

## BOARD DIPLOMA EXAMINATION, (C–14)

## APRIL/MAY—2015

## DEEE–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 the base and supplementary units of SI system along with their symbols.

**2.** State and explain triangle law of vectors with neat diagram.

**3.** A body is thrown up vertically with a velocity of 19·6 ms $^{1}$. Find the maximum height reached by the body.

**4.** A particle in SHM has velocity 4 ms $^{1}$ at mean position. Its time period is 3·14 seconds. Find the amplitude.

**5.** State Boyle's law in gases. Express its relation in terms of density.

**6.** State any three conditions for good auditorium.

**7.** State Hooke's Law.

**8.** Define coefficient of viscosity. Write Poiseuille's equation for coefficient of viscosity.

**9.** Draw a neat sketch of meter bridge. Write the formula to determine unknown resistance using meter bridge.

**10.** Write three applications of photoelectric effect.

## 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 scalar product. Mention any five properties of scalar product. 2+5

*(b)* A force of $(4\hat{i} \quad 3\hat{j} \quad 6\hat{k})$ N acts on a body and produces a displacement of $(3\hat{i} \quad 2\hat{j} \quad 5\hat{k})$ m. Calculate the work done. 3

**12.** *(a)* Define projectile. Show that the path of a projectile is a parabola in the case of horizontal projection. 1+6

*(b)* An aeroplane flying horizontally with a speed of 180 kmhr $^{1}$ releases a bomb at a height of 490 m from the ground. Find when and where the bomb will strike the ground. 3

**13.** *(a)* Define friction. Derive an expression for acceleration of a body when projected up on a rough inclined plane. 1+6

*(b)* State three laws of static friction. 3

**14.** *(a)* State the law of conservation of energy. Verify the law of conservation of energy in the case of a freely falling body. 1+6

*(b)* A body is thrown up vertically with a velocity of 49 ms $^{1}$. How high will it rise before its kinetic energy becomes zero? Apply law of conservation of energy. 3

**15.** *(a)* Define seconds pendulum. Derive an expression for the time period of simple pendulum. 1+6

*(b)* Find the length of the seconds pendulum where acceleration due to gravity is 9·8 ms $^{2}$. 3

**16.** *(a)* Define absolute zero temperature. Derive the relation $C_P \quad C_V \quad R$. 1+6

*(b)* When heat energy of 2000 joule is supplied to a gas at constant pressure 2 $10^5$ Nm $^{2}$, there was an increase in its volume equal to 0·004 $m^3$. Calculate the increase in internal energy of the gas. 3

**17.** *(a)* Define Doppler effect. Write any five causes of noise pollution. 2+5

*(b)* Write any three applications of beats. 3

**18.** *(a)* Define magnetic lines of force. State and explain Kirchhoff's laws in electricity. 1+3+3

*(b)* Two magnetic poles of strength 40 A-m and 20 A-m are separated by a distance of 0·2 m in air. Calculate the force between them. 3

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