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 C_V 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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