C09–CHPC–103/C09–EC–103/C09–PET–**103**

3029

BOARD DIPLOMA EXAMINATION, (C–09)
MARCH/APRIL—2014
DCE—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 any three advantages of SI units.

2. Find the dot product of two vectors $\vec{A}\ 2\vec{i}\ 3\vec{j}\ 4\vec{k}$ and $\vec{B}\ \vec{i}\ 2\vec{j}\ \vec{k}$.

3. Derive the expression for range of a projectile.

4. State the laws of friction.

5. Define SHM. Give two examples.

6. State I and II laws of thermodynamics.

7. What is Sabine's formula?

8. State Hooke's law. Define stress and strain.

9. Define magnetic lines of force and magnetic induction field strength.

10. State the laws of photoelectric effect.

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)* State and prove parallelogram law of vectors. 2+5

(b) The resultant of two equal forces acting at right angles to each other is 1414 N. What is the magnitude of each force? 3

12. *(a)* Define projectile. Give two examples. 1+2

(b) Show that the path of a projectile is parabola in the case of horizontal projection. 4

(c) If the range of a projectile is equal to maximum height reached, find the angle of projection. 3

13. *(a)* Derive the expression KE $\frac{1}{2} mv^2$. 6

(b) A machine gun fires 360 bullets per minute and each bullet travels with a velocity of 600 m/s. If the mass of each bullet is 5 g. Find the power of the machine gun. 4

14. *(a)* Derive an expression for time period of a simple pendulum. 6

(b) Calculate the length of a seconds pendulum at the equator where the value of g is 9·78 m/s^2. 4

15. *(a)* State gas laws. Derive the ideal gas equation *PV RT*. 3+4

(b) The volume of a gas at 30 °C is 200 cc. What is the volume of the gas if the temperature of the gas is raised to 100 °C at constant pressure. 3

16. *(a)* Define noise pollution and give any four effects of noise pollution. 1+4

(b) Define beats. Give any four applications of beats. 1+4

17. *(a)* Describe an experiment to determine the coefficient of viscosity of a liquid by Poiseuille's method. 6

(b) Write any four applications of viscosity. 4

18. *(a)* State Kirchhoff's laws. 4

(b) Explain how the unknown resistance can be found using a metre bridge. 6

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