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C09–PET–103/C09–TT–103/C09–RAC–103

3003

BOARD DIPLOMA EXAMINATION, (C–09)

MARCH/APRIL—2016

FIRST YEAR (COMMON) 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. The velocity of a body is given by the equation $V = at^2 + bt + c$. Find the dimensional formulae for A, B and C, when t is time.

2. State and explain Triangle law of vectors.

3. Derive the expression for the range of a projectile in the case of oblique projection.

4. State the laws of static friction.

5. Define Seconds pendulum and find the length of it, when $g \quad 9 \ 8 \, m / sec^2$.

6. State the First and second laws of thermodynamics.

7. Define 'Reverberation and 'Reverberation Time'.

8. State and explain Hooke's law.

9. If 30 ohms and 90 ohms are connected in left and right gaps in metre bridge experiment, find the balancing length.

10. Write any three applications of optical fibres.

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 and vector products of two vectors and write two properties of each of them. 2+4

(b) Show if $\vec{A} \quad 3\vec{i} \quad 2\vec{j} \quad \vec{k}$ and $\vec{B} \quad \vec{i} \quad 3\vec{j} \quad \vec{k}$ are two adjacent sides of a parallelogram, then find the area of the parallelogram. 4

12. *(a)* Show that the time of ascent is equal to time of descent in the case of vertically projected body. 6

(b) A shot is fired horizontally at a velocity of 200 m/sec. Find the magnitude and direction of velocity after 10 seconds. 4

13. *(a)* Define potential energy and kinetic energy. 3

(b) Show that KE $\frac{1}{2}mV^2$. 4

(c) The momentum of the body of mass 2 kg is 50 kg m/s. Find its kinetic energy. 3

14. *(a)* Derive the expression for displacement and velocity of the particle executing Simple Harmonic Motion (SHM). 6

(b) A particle is undergoing SHM passes through the mean position with a velocity 2 m/sec. Find the velocity of the particle at the point where its displacement is half the amplitude. 4

15. *(a)* State and explain gas laws. 6

(b) Write four differences between isothermal and adiabatic change. 4

16. *(a)* What is noise pollution? Write various causes of noise pollution and explain briefly the effects caused by noise pollution. 1+3+3=7

(b) What is an echo? How to minimize an echo? 3

17. *(a)* Explain surface tension with reference to molecular theory. 4

(b) State and explain different types of moduli of elasticity. 6

18. *(a)* State and explain Kirchhoff's laws. 2+2=4

(b) Define magnetic induction field strength. Derive the equation of couple on a bar magnet placed in uniform magnetic field. 1+5=6

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