C14–A/AA/BM/CH/CHST/AEI/MET/

MNG/IT/TT/PCT–**103**

4003

BOARD DIPLOMA EXAMINATION, (C–14)
OCT/NOV—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. Define fundamental quantities and derived quantities, and give two examples for each.

2. A force of 200 N is inclined at an angle 30° to the horizontal. Find the components in horizontal and vertical directions.

3. Define projectile. Give two examples.

4. State the conditions of simple harmonic motion.

5. Define two molar specific heats of a gas.

6. What is Doppler effect? Mention any two applications.

7. Define surface tension and give two examples.

8. What is the effect of temperature on viscosity of liquids and gases?

9. State Kirchhoff's laws.

10. Write any three applications of photoelectric cell.

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PART—B   10×5=50

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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.   2

(b) State any four properties of cross product.   4

(c) If $\vec{A}$ $2\vec{i}$ $3\vec{j}$ $\vec{k}$ and $\vec{B}$ $\vec{i}$ $4\vec{j}$ $2\vec{k}$, find $\vec{A}$ $\vec{B}$.   4

12. *(a)* Derive an expression for the path of projectile in horizontal projection.   5

(b) A bomb is dropped from an aeroplane flying horizontally with a velocity of 9·8 m/s at a height 78·4 m from the ground. Find when and where it reaches the ground.   5

13. *(a)* Define normal reaction.   2

(b) Derive an expression for acceleration of a body projected upon a rough inclined plane.   5

(c) Write any three methods of reducing friction.   3

14. *(a)* Define potential energy and give two examples.   3

(b) State the law of conservation of energy. Verify the law in case of a free falling body.   1+6

15. *(a)* Derive the expressions for *(i)* displacements and *(ii)* acceleration of a body executing simple harmonic motion. 6

(b) Calculate the maximum acceleration of a particle executing simple harmonic motion whose amplitude is 0·02 m and frequency is 50 Hz. 4

16. *(a)* Write any four differences between isothermal and adiabatic processes. 4

(b) Derive the ideal gas equation, *PV   RT*. 6

17. *(a)* State the conditions of a good auditorium. 4

(b) Define the phenomenon of beats. Write any four applications of beat. 2+4

18. *(a)* State Ohm's law. 2

(b) Draw a neat sketch of metre bridge. 3

(c) Derive an expression for moment of couple on a bar magnet placed in a uniform magnetic field. 5

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