C16–A/AA/BM/CH/CHST/AEI/MET/
MNG/TT/IT/PCT—**103**

6003

BOARD DIPLOMA EXAMINATION, (C–16)
MARCH/APRIL—2018
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. What are the advantages of SI units?

2. State polygon law of vectors and explain.

3. What should be the velocity with which a bomb is to be projected obliquely to have maximum range of 1960 m, the value of g is 9·8 m/s^2?

4. Define simple harmonic motion and give one example.

5. State first and second laws of thermodynamics.

6. A person standing between two hills fires a gun. He hears first echo after 1 s and the second echo after 2 s. If the distance between the hills is 510 m, find the velocity of sound in air.

7. Define the terms stress and strain.

8. Explain the effect of temperature on viscosity of liquids and gases.

9. Write any three properties of magnetic lines of force.

10. Write any three laws 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.   3

(b) Mention any four properties of scalar product.   4

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

12. *(a)* Define projectile and give one example.   2

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

(c) An airplane flying horizontally with a speed of 360 kmph releases a bomb at a height of 1960 m from the ground. Find when and where the bomb will strike the ground. The value of g is $9 \cdot 8$ m/s^2.   4

13. *(a)* State the laws of static friction.   3

(b) Write any three advantages of friction.   3

(c) Derive a formula to find the acceleration of a body on rough inclined plane when the body is sliding up.   4

14. *(a)* State the law of conservation of energy and give two examples. 3

(b) Prove the law of conservation of energy in the case of freely falling body. 5

(c) If 100 kg m/s is the momentum of the body of mass 10 kg, find its kinetic energy. 2

15. *(a)* Derive an expression for the time period in the case of simple pendulum. 6

(b) A body is executing SHM with an acceleration of 0.2 m/s^2 at a distance of 0.8 m. What is its distance if the acceleration is 0.3 m/s^2? 4

16. *(a)* Derive the gas equation, *PV   RT*. 6

(b) 546 cc of gas at 273 ºC is cooled at constant pressure until its volume becomes half. What is the temperature of gas after cooling? 4

17. *(a)* Write any three differences between musical sound and noise. 3

(b) What is noise pollution? Write any three causes for the noise pollution and write any three measures to be taken to minimize the noise pollution. 7

18. *(a)* Define specific resistance and write down an expression for resistance of a wire. 3

(b) Obtain the balancing condition of Wheatstones bridge from Kirchhoff's laws by drawing a neat diagram. 7

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