4051

BOARD DIPLOMA EXAMINATION, (C–14)
OCT/NOV—2016
DME–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. What are the applications of dimensional analysis?

2. Define scalars and vectors. Write two example for each.

3. Define time of flight and range of a projectile.

4. Write any three conditions of SHM.

5. What is the relation between centigrade scale and Kelvin scale? Find the boiling point of water on Kelvin scale.

6. Define reverberation and reverberation time.

7. Define surface tension. Write two examples.

8. Write about Newton's formula for viscous force.

9. Each pole of a bar magnet experiences a force of 4×10^4 N when placed in a uniform magnetic field of induction 2×10^5 N/A-m. Calculate the pole strength of the bar magnet.

10. Write any three laws of Photoelectric effect.

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PART—B $\qquad$ 10×5=50

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Instructions : (1) Answer *any* **five** questions.

$\qquad$ (2) Each question carries **ten** marks.

$\qquad$ (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. $\qquad$ 2

$\qquad$ *(b)* State and explain polygon law of addition of vectors. $\qquad$ 4

$\qquad$ *(c)* Find the resultant of forces 3 N and 4 N acting at right angles to each other. $\qquad$ 4

12. *(a)* Show that the path of a projectile in oblique projection is parabola. $\qquad$ 6

$\qquad$ *(b)* A gun fires a bullet horizontally with a certain velocity from an elevation of 9·8 m. If it hits the ground at a distance 9·8 m from the foot of elevation, find the velocity of the bullet at the beginning. $\qquad$ 4

13. *(a)* Write any four methods of reducing friction. $\qquad$ 4

$\qquad$ *(b)* Derive equation for acceleration of a body sliding down on a rough inclined plane. $\qquad$ 6

14. *(a)* State and prove law of conservation of energy in case of a freely falling body. $\qquad$ 2+5=7

$\qquad$ *(b)* The potential energy acquired by a body when it is carried to a height of 80 m is 7840 J. Find the mass of the body. $\qquad$ 3

15. *(a)* Derive equation for time period of a simple pendulum.   8

     (b) Define SHM with two examples.   2

16. *(a)* Derive ideal gas equation $PV = nRT$.   6

     (b) State 1st law and 2nd law of thermodynamics.   4

17. *(a)* Write any six effects of noise pollution.   6

     (b) Define Doppler effect. Write its two applications.   4

18. *(a)* Derive expression for balancing condition of Wheatstone bridge.   6

     (b) A balancing point in a metre bridge experiment is obtained at 30 cm from the left. If the right gap contains 3·5 ohm, what is the resistance in the left gap?   4

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