3035

BOARD DIPLOMA EXAMINATION, (C–09)
OCT/NOV—2013
DEEE—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. If the unit of length and force be increased 4 times, how does the unit of work increase?

2. Define scalars and vectors. Give an example for each.

3. A body is allowed to fall freely from a height 1960 m. Find the velocity on reaching the ground.

4. What is friction? Give two examples of friction in daily life.

5. What is a simple pendulum? Explain the effect of *g* on the time period.

6. Define adiabatic process. State whether Boyle's law is obeyed in this process.

7. Define echoes and write their uses.

8. Define stress and name different types of stress.

9. Write an expression for the moment of couple on a bar magnet placed in a uniform magnetic field. Discuss the case when   90º.

10. Explain the relation between the critical temperature of a super-conductor and its atomic mass.

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)* State and explain polygon law with a figure.   5

(b) A force $6i$ $12j$ $8k$ produces a displacement of $2i$ $3j$ $5k$. Find the work done.   5

12. *(a)* Define the terms time of ascent, time of flight, range and maximum height reached by a body projected obliquely.   4

(b) State two practical applications of projectile motion.   2

(c) A shot is fired horizontally at a velocity of 300 m/s. Find the magnitude and direction of velocity after 8 seconds.   4

13. *(a)* State the principle of conservation of energy.   2

(b) Prove the law of conservation of energy in case of a freely falling body.   6

(c) A bullet of mass 10 grams is fired with a velocity of 300 m/s. Find its kinetic energy.   2

14. *(a)* Define SHM.   2

(b) Show that the projection of a body revolving round the circumference of a circle on a diameter is simple harmonic.   5

(c) The equation for displacement of a particle executing SHM is given as $x = 0.8\sin(2\pi t)$. Find its amplitude, time period and frequency.   3

15. *(a)* Write any four differences between the gas constant and universal gas constant.   4

(b) A certain mass of gas in a cylinder at 27 °C has a volume of 10 litres and pressure $100\text{N}/\text{m}^2$. *(i)* The gas is first compressed at constant temperature and the pressure is raised to $150\text{N}/\text{m}^2$. Find the change in volume. *(ii)* If the gas is heated at constant volume and if the final temperature is raised to 127°C, then find the new pressure.   6

16. *(a)* Distinguish between musical sound and noise.   4

(b) What are the effects of noise pollution?   6

17. *(a)* Explain any two illustrations of surface tension.   4

(b) Write the expression for the surface tension based on capillarity and explain the terms involved.   6

18. *(a)* Derive the condition of balance for a Wheatstone bridge.   7

(b) If the length of a conducting wire is increased 4 times and its area of cross-section is doubled, then find how its resistance changes.   3

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