

**GULF SAHODAYA (SAUDI CHAPTER) EXAMINATION-2015**

**CLASS-XI  
PHYSICS**

**Maximum Marks : 70  
Time : 3 Hrs**

**General Instructions:**

**SET-C**

- (i) All questions are compulsory.
- (ii) There is no overall choice. However an internal choice has been provided in one question of 2 marks, one question of 3 marks and all the three questions of 5 marks.
- (iii) Question numbers 1 to 5 are very short answer type questions carrying 1 mark each.
- (iv) Question numbers 6 to 10 are short answer type questions carrying 2 marks each.
- (v) Question numbers 11 to 22 are short answer type questions carrying 3 marks each.
- (vi) Question number 23 is a value based question carrying 4 marks.
- (vii) Question numbers 24 to 26 are long answer type questions carrying 5 marks each.
- (viii) Use of calculator is not permitted. However you may use log table, if necessary.

1. What is the time period of oscillation of a simple pendulum mounted in a cabin that is freely falling under gravity?
2. A railway carriage of mass 10000kg moving with a speed  $15\text{ms}^{-1}$  hits a stationary carriage of same mass. After the collision the carriages get coupled and move together. What is their common velocity after collision?
3. Oxygen and hydrogen gas are at the same temperature T. What is the ratio of kinetic energies of oxygen molecule and hydrogen molecule if oxygen is 16 times heavier than hydrogen?
4. A bucket containing water is tied to one end of a rope 1m long and rotated about the other end in a vertical circle. What is the minimum velocity at the lowest point so that the water may not spill?
5. State Wien's displacement law.
6. Explain how will you determine the size of an oleic acid molecule.
7. Draw the velocity- time graph and acceleration -time graph for freefall.

**OR**

A car travelling at 20m/s takes a U turn in 10s. What is the acceleration of the car?

8. Define gravitational potential energy. Find the gravitational potential energy of a system of four particles each of mass m placed at the vertices of a square of side a.
9. A piece of copper having rectangular cross section 15mm x 19mm is pulled by a force of 44500N producing elastic deformation. Calculate the resulting strain. Shear modulus of copper is  $42 \times 10^9$ .
10. State and prove law of conservation of linear momentum.
11. Define centre of mass. Two balls of masses 3m and m are separated by a distance L. Find the position of the centre of mass.

