

GULF SAHODAYA (SAUDI CHAPTER) EXAMINATION -2011

GRADE: XI

Maximum marks: 70

Time: 3 hours

Total pages: 04

SUBJECT: PHYSICS

SET-A

General Instructions:

- (i) All questions are compulsory.
- (ii) There are 30 questions in total. Questions 1 to 8 carry one mark each, questions 9 to 18 carry two marks each, questions 19 to 27 carry three marks each and questions 28 to 30 carry five marks each.
- (iii) There is no overall choice. However, an internal choice has been provided in one question of two marks, one question of three marks and all three questions of five marks each. You have to attempt only one of the given choices in such questions.
- (iv) Use of calculators is not permitted. However you may use log table if necessary.

1. In the equation, $y = A \sin (\omega t - kx)$, obtain the dimensional formula of ' ω ' and ' k '. Given ' x ' is distance and ' t ' is time.
2. If oil of density higher than density of water is used in a resonance tube, how will the frequency change?
3. The escape velocity of a body projected vertically upwards from the surface of the earth is ' v '. What is the escape velocity, if the body is projected in a direction making an angle ' θ ' with the vertical?
4. Comets move around the sun in highly elliptical orbits. The gravitational force on the comet due to the sun is not normal to the comet's velocity in general. Yet the work done by the gravitational force over every complete orbit of the comet is zero. Why?
A child sits stationary at one end of a long trolley moving uniformly with a speed ' V ' on a smooth horizontal floor. If the child gets up and runs about on the trolley in any manner, what is the speed of the CM of the (trolley + child) system?
6. The displacement-time graph for the two particles 'A' and 'B' are straight lines inclined at angles of 30° and 45° with the time axis. What is the ratio of the velocities $v_A : v_B$?
7. A man with wrist watch on his hand falls from the top of the tower. Does the watch give correct time during the free fall? Give reason for your answer.
8. Two particles of equal mass move in a circle of radius ' r ' under the action of their mutual gravitational attraction. Find the speed of each particle if its mass is ' m '.
9. State parallelogram law of vector addition. Give the magnitude and direction of two vectors ' a ' and ' b ' making an angle ' θ ' between them.

