



INDIAN SCHOOL SOHAR
UNIT TEST- 2018(PHYSICS – THEORY)

CLASS: XI
DATE: 17/05/2018

MAXIMUM MARKS: 50
DURATION: 2Hrs

General Instructions :

All questions are compulsory.

There are 18 questions in all .Questions 1 to 2 carry one mark each, questions 3 to 6 carry two marks each, questions 7to 16 carry three marks each and questions 17 and 18 carry five marks each.

There is no overall choice. However, internal choice has been provided in one question of two marks, one question of three marks and all two questions of five marks each. You have to attempt only one of the given choices in such questions

Use of calculator is not permitted.

1. Mention the names of natural forces in increasing order of their strength. (1)
2. Convert one minute into radian. (1)
3. The moon is observed from two diametrically opposite points A and B on the earth. The angle subtended at the moon by the two directions of observation is $1^{\circ}54'$. Given, the diameter of the earth to be about 1.276×10^7 m, compute the distance of the moon from the earth. (2)
4. Name the principle related to the following technologies:
(a) particle accelerators (b) aeroplane (c) Steam engine (d) hydroelectric power. (2)
5. Briefly explain how to estimate the molar diameter of oleic acid.
OR
5. With the help of a diagram show that the vector addition is associative. (2)
6. Derive the dimensional formula of (i) Planck's constant (ii) linear momentum. (2)
7. Given that the period T of oscillation of a gas bubble from an explosion under water depends on pressure P, density of water d, total energy E of the explosion. Find dimensionally a relation for T.
OR
7. The velocity of a body which has fallen freely under gravity varies as g and h, where 'g' is the acceleration due to gravity at a place and 'h' is the height through which the body has fallen. Determine dimensionally the relation for the velocity v of the body. (3)
8. The velocity 'v' of a particle is given in terms of time 't' by the equation $v = at + \frac{b}{t+c}$. Determine the dimensions of a,b,c .State the principle used. (3)
9. What is a leastcount error. Mention the causes of such errors with the help of an example. How can you minimize them. (3)

10.(a) State the triangle law of vector addition.

(b) Rain is falling vertically with a speed of 30m/s. Winds starts blowing after sometime with a speed of 12m/s in west to east direction. Find the velocity of the resultant vector. In which direction should a boy hold his umbrella standing at a bus stop to avoid rain. (3)

11. Define instantaneous velocity . Write its expression with units.

A body moving with a uniform acceleration describes 12 m in third second of its motion and 20m in the fifth second. Find the velocity after 10 seconds. (3)

12. Define stopping distance. Write its mathematical expression.

The displacement of a particle starting at any instant is given by $x=8t^2-3t^3$. Calculate the average acceleration in the time interval from $t=0$ to $t=2s$, x is measured in m. (3)

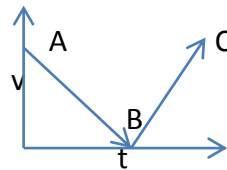
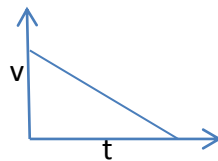
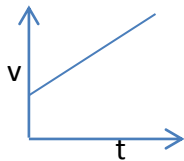
13. State the parallelogram law of vector addition. Derive an expression for magnitude of the resultant of two vectors **A** and **B** using parallelogram method of vector addition. (3)

14.(a) Define solid angle with the help of a diagram and express it mathematically.

(b) Mention the contribution made by the following physicists (i) Michael faraday (ii) J.C.Bose (iii) Albert Einstein. (3)

15. Mention equation of motion for a freely falling body. Draw a-t, v-t, y-t graph for a free fall of an object. (3)

16. What do the following graphs represent. Explain the nature of motion of the body in each case. (3)



17. Obtain the kinematic equations for a body in uniform acceleration using velocity time graph.

OR

17. Derive the kinematic equations of motion for a particle after a time 't' by calculus method. (5)

18. (a) Define absolute error, mean absolute error and relative error. Mention their mathematical expressions.

(b) A physical quantity X is related to four measurable quantities a, b, c, d as follows:

$P = a^2 b^3 c^{5/2} d^{-2}$ The percentage error of measurement in a, b, c, d are 1%, 2%, 3% and 4% respectively. What is the percentage error in the quantity X ?

OR

18. (a) Derive an expression of relative velocity . Hence define relative velocity.

(b) Two railway tracks are parallel to North-South direction. Train A is moving with a speed of 40m/s from north to south along one track, while train B is moving with a speed of 30m/s from south to north. Calculate (i) relative velocity of B w.r.to A. (ii) relative velocity of ground w.r.to A. (5)