



INDIAN SCHOOL SOHAR
UNIT TEST 2019-20
PHYSICS

CLASS XI
DATE: 14.05.19

Max Marks : 50
Duration : 2 hours

General Instructions:

- I. All questions are compulsory. There are 19 questions in all.*
- II. This question paper has **six** sections: Section A, Section B, Section C, Section D, Section E and Section F.*
- III. Section A contains **five** questions of **one** mark each, Section B contains **five** questions of **one** mark each, Section C contains **five** questions of **one** mark each, Section D contains five questions two marks, Section E contains **five** questions of **three** marks each and Section F contains two questions of five marks each.*
- IV. 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 the **two** questions of **five** marks weightage. You have to attempt only **one** of the choices in such questions.*

Section A (Multiple Choice Questions – 1 Mark)

1. Parsec is a unit of
 - (a) time
 - (b) distance
 - (c) sunlight intensity
 - (d) mass

2. The dimensional formula for Planck's constant is
 - (a) [MLT]
 - (b) [ML²T⁻¹]
 - (c) [M²L²T⁻¹]
 - (d) [ML¹T⁻¹]

3. The dimensions of Kinetic energy is same as that of
 - (a) Force
 - (b) Pressure
 - (c) Work
 - (d) Momentum

4. The displacement of a particle is given by $x = (t - 2)^2$ where x is in metres and t in seconds.
The distance covered by the particle in first 4 seconds is

1.49×10^{11} m. What is the diameter of the Sun?

17. A ball is thrown vertically upwards. Draw its: (1). velocity-time curve (2). Acceleration – time curve
18. The distance travelled by the body in straight line motion is found to be directly proportional to the square of time. Is the body with uniform velocity or acceleration? Justify.
19. List any two important contributions to the scientific world made by Galileo Galilei.
20. Write about different branches of physics.

Section E (3- Marks)

21. The displacement of a particle is given by $x = 18t + 5t^2$. Calculate the instantaneous velocity at $t = 2$ s, average velocity between $t = 2$ s and $t = 3$ s and the instantaneous acceleration.
22. Every measurement is vulnerable to some uncertainties to some extent. Elaborate this statement describing different types of errors

OR

Explain the method to determine molecular size of Oleic acid. A drop of Olive oil of radius 0.25mm spreads into a circular film of diameter 20 cm on the water surface. Estimate the size of an oil molecule given that olive oil spreads as a film which is one molecule thick on the water surface.

23. In an experiment the refractive index of glass is found to be 1.54, 1.53, 1.44, 1.54, 1.56, 1.45 in successive measurements. Calculate mean absolute error, relative error and percentage error.
24. Check the accuracy of the following relations
- i) $E = mgh + \frac{1}{2} mv^2$
- ii) $v^2 - u^2 = 2aS^2$
- iii) $P = \rho gh$ where ρ is the density of water, g acceleration due to gravity and h is height.
25. Assuming that the frequency f of a vibrating string may depend upon i) applied load (F) ii) length (L)

of the string and mass per unit length (m). Prove that $f \propto \frac{1}{L} \sqrt{\frac{F}{m}}$.

Section F (5-Marks)

26. State homogeneity principle. What do you mean by dimensional equation? The velocity v of water waves may depend on their wavelength λ ; the density of water ρ and the acceleration due to gravity g . find the relation between these quantities by the method of dimensions. What are the limitations of dimensional analysis?

OR

Explain the terms:

- (a) (i) displacement (ii) Average velocity
(iii) Instantaneous velocity (iv) average speed.
- (b) Draw position – time graph for uniform motion and how do find out average velocity from x-t graph for non-uniform motion
- (c) A body can have zero average velocity but not zero average speed. Comment.

27. Briefly explain the four fundamental forces of nature. Write their relative ranges and strength.

OR

Derive the kinematics equations (Equations of motion) from velocity –time graph.

A cyclist covers first half of a length with a speed of 5 m/s. and the second half with a speed of 10 m/s what is the average speed of the cyclist?
