

## UNIT TEST

STD: 11 (SCIENCE STREAM)

TIME: 1 HOUR

SUBJECT: PHYSICS (054)

MARKS: 25

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### Section A

➤ **Do as directed. Each carries 1 mark** [ 5 ]

- 1 Write the two basic principal in physics.
- 2 Which is the weakest fundamental force in nature?
- 3 The electric force between two protons is \_\_\_\_\_ times the gravitational force between them for any fixed distance. (Fill in blank)
- 4 The number of significant figure in 0.06900 is  
  
(A) 2      (B) 4      (C) 3      (D) 5
- 5  $\frac{1\mu m \times 1nm}{1 Cm} = \underline{\hspace{2cm}}$  (choose the correct option)  
  
(A)  $10^{-13}$       (B)  $10^{-15}$       (C)  $10^{-17}$       (D)  $10^{-11}$

### Section B

➤ **Answer in short for the following questions Each carries 2 marks**

- 6 Write a short note on strong Nuclear Force.
- 7 Each side of a cube is measured to be 7.203 m. What are the total Surface area [ 6 ] and the volume of the cube to appropriate significant figures?

**OR**

Fill in the blanks

- (a) The volume of a cube of side 1 cm is equal to \_\_\_\_\_  $m^3$
- (b) The surface area of solid cylinder of radius 2.0 cm and height 10.0 cm is equal to \_\_\_\_\_  $(mm)^2$
- 8 Using Parallax method, explain the measurement of large distance.

## Section C

➤ Answer the following questions Each carries 3 marks.

- 9 When the planet Jupiter is at a distance of 824.7 million kilometers from the earth. Its angular diameter is measured to be 35.72" of arc. Calculate the diameter of Jupiter.

[ 9 ]

- 10 A Physical quantity P is related to four observables a, b, c and d as follows

$$P = \frac{a^3 b^2}{\sqrt{c} d}$$

The percentage errors of measurement in a, b, c and d are 1%, 3%, 4%, and 2% respectively. What is the percentage error in the quantity P.

- 11 Consider a simple pendulum, having a bob attached to a string that oscillations under the action of force of gravity. Suppose that period of oscillations of the simple pendulum depends on its length (l), mass of the bob (m) and acceleration due to gravity (g).

Derive the expression for the time period using method of dimensions

( OR )

We measure the period of oscillation of a simple pendulum. In successive Measurements the readings turn out to be 2.63 S, 2.56 S, 2.42 S, 2.71 S, and 2.80 S.

Calculate the absolute errors, relative error and percentage error.

## Section D

➤ Answer the following question

12 Explain

- (a) Error of a sum or a difference
- (b) Error of a product or a quotient
- (c) Error in case of a measured quantity raised to a power

[ 5 ]

OR

- (a) What is called 'error'
- (b) Two resistors of resistances  $R_1 = 100 \pm 3$  ohm and  $R_2 = 200 \pm 4$  ohm are connected  
(A) In series (B) In parallel

Find the equivalent resistance of the

- (a) Series combination
- (b) Parallel combination

Use for (a) the relation  $R = R_1 + R_2$  and

$$\text{for (b) } \frac{1}{R'} = \frac{1}{R_1} + \frac{1}{R_2} \text{ and } \frac{\Delta R'}{R'^2} = \frac{\Delta R_1}{R_1^2} + \frac{\Delta R_2}{R_2^2}$$