

NEW STANDARD ACADEMY

Marks: 60

Date : 13-04-2026

CLASS : 11TH

Time: 3 hours

PHYSICS

- 5.74 g of a substance occupies 1.2 cm^3 . Express its density by keeping the significant figures in view.
- A new unit of length is chosen such that the speed of light in vacuum is unity. What is the distance between the Sun and the Earth in terms of the new unit if light takes 8 min and 20 s to cover this distance ?
- The photograph of a house occupies an area of 1.75 cm^2 on a 35 mm slide. The slide is projected on to a screen, and the area of the house on the screen is 1.55 m^2 . What is the linear magnification of the projector-screen arrangement.
- The mass of a box measured by a grocer's balance is 2.30 kg. Two gold pieces of masses 20.15 g and 20.17 g are added to the box. What is the total mass of the box, to correct significant figures ?
- Let us consider an equation
$$\frac{1}{2} m v^2 = m g h$$
where m is the mass of the body, v its velocity, g is the acceleration due to gravity and h is the height. Check whether this equation is dimensionally correct
- Each side of a cube is measured to be 7.203 m. What is the total surface area to appropriate significant figures?
- The SI unit of energy is $\text{J} = \text{kg m}^2 \text{ s}^{-2}$; that of speed v is m s^{-1} and of acceleration a is m s^{-2} . Which of the formulae for kinetic energy (K) given below can you rule out on the basis of dimensional arguments (m stands for the mass of the body) :
 - $K = m^2 v^3$
 - $K = (1/2)mv^2$
- One mole of an ideal gas at standard temperature and pressure occupies 22.4 L (molar volume). What is the ratio of molar volume to the atomic volume of a mole of hydrogen ? (Take the size of hydrogen

molecule to be about 1 \AA). Why is this ratio so large ?

- If $x = a + bt + ct^2$ where x is in metres and t in seconds. What are units of b and c ?
- Name any two physical quantities which have dimensions $[\text{M L}^2 \text{ T}^{-2}]$

CHEMISTRY

- A piece of metal is 3 inch (represented by in) long. What is its length in cm?
- A jug contains 2L of milk. Calculate the volume of the milk in m^3 .
- A compound contains 4.07% hydrogen, 24.27% carbon and 71.65% chlorine. Its molar mass is 98.96 g. What are its empirical and molecular formulas?
- How many moles of methane are required to produce 22g CO_2 (g) after combustion?
- A solution is prepared by adding 2 g of a substance A to 18 g of water. Calculate the mass per cent of the solute.
- The density of 3 M solution of NaCl is 1.25 g mL^{-1} . Calculate the molality of the solution.
- Calculate the mass per cent of different elements present in sodium sulphate ($\text{Na}_2 \text{SO}_4$).
- What is the SI unit of mass? How is it defined?
- How are 0.50 mol $\text{Na}_2 \text{CO}_3$ and 0.50 M $\text{Na}_2 \text{CO}_3$ different?
- Calculate the molarity of a solution of ethanol in water, in which the mole fraction of ethanol is 0.040 (assume the density of water to be one).

BIOLOGY

- Why is the cell called a structural and functional unit of the body.
- Give two major differences between prokaryotic and eukaryotic cell
- How are plant cells different from animal cells.
- What is the function of phospholipid in the cell membrane.

5. Why prokaryotic cell exception of cell theory.
6. Define osmosis with an example.
7. What is your modern cell theory
8. Gives the name of the largest and smallest cell of living organisms
9. What is the endo membrane system.
10. Draw well labelled diagram of bacteria.

MATH'S

1. State which of the given collection of objects is a set:
 - (i) The collection of novels written by Munshi Prem Chand.
 - (ii) The collection of 10 most talented students of your school
 - (iii) Collection of all rivers flowing in India.
 - (iv) Collection of 5 rivers flowing in India.
2. Use the roster method to represent the following sets
 - (i) The counting numbers which are multiples of 6 and less than 50.
 - (ii) The fractions whose numerator is 1, and whose denominator is a counting number less than 10.
 - (iii) $\{x : x \in \mathbb{N} \text{ and is a prime factor of } 84\}$
 - (iv) The set of odd integers lying between -4 and 8.
3. Write the following sets in the builder form
 - (i) $\{1, 3, 5, 7, 9, 11, 13\}$
 - (ii) $\{2, 4, 6, 8, \dots\}$
 - (iii) $\{3, 6, 9, 12, 15\}$
 - (iv) $\{15, 25, 125, 625\}$
4. Which of the following are examples of the null set?
 - (i) Set of even prime numbers
 - (ii) Set of odd natural numbers divisible by 2
 - (iii) $\{x : x \text{ is a student of your school presently studying in both classes XI and XII}\}$
5. If $A = \{1, 2, 3, 4, 5, 6\}$ and $B = \{2, 4, 6, 8\}$, find

(i) $A \cup B$	(ii) $A \cap B$
(iii) $A - B$	(iv) $B - A$
6. If $\xi =$ (all digits in our decimal system), $A = \{x : x \text{ is prime}\}$, and $B = \{x : x^2 < 25\}$, then write the following:

(i) $B - A$	(ii) $A \cup B$
(iii) $(A \cup B)'$	

7. A college awarded 38 medals for Honesty, 15 for Punctuality and 20 for Obedience. If these medals were bagged by a total of 58 students and only 3 students got medals for all three values, how many students received medals for exactly two of the three values?
8. If A and B are two sets such that $n(A) = 28$, $n(B) = 32$ and $n(A \cup B) = 50$, find $n(A \cap B)$.
9. If $n(\xi) = 40$, $n(A) = 22$, $n(A \cap B) = 8$ and $n(A \cup B)' = 6$, determine $n(B)$.
10. In a survey of 25 students, it was found that 15 had taken Mathematics, 12 had taken Physics and 11 had taken Chemistry, 5 had taken Mathematics and Chemistry, 9 had taken Mathematics and Physics, 4 had taken Physics and Chemistry and 3 had taken all the three subjects. Find the number of students that had taken
 - (i) only Mathematics
 - (ii) Physics and Chemistry but not Mathematics
 - (iii) Mathematics and Physics but not Chemistry
 - (iv) none of the three subjects