

NEW STANDARD ACADEMY

Semri Kothi Super Market, Raebareli

CLASS 11 (Academy) 12-05-2025

PHYSICS

1. A body travels the first half of the total distance with a velocity v_1 and the second half with a velocity v_2 . Calculate the average velocity.
2. A car covers the first half of the distance between two places at a speed of 40 km h^{-1} and second half with a speed of 60 km h^{-1} . What is average speed of car?
3. A boy reached a railway station 4 km away from his house running with a uniform speed in 1-0 hour. He took rest for 0-5 hour at the station and then came back to his house walking with uniform speed in 1-5 hour. Represent the whole journey of the boy by a time-displacement graph and determine his average speed.
4. A car moving on a straight road covers one-third of the distance with 20 km/h and the rest with 60 km/h. What is the average speed of car?
5. A train 600 m long crosses a bridge of 1000 m in 10 s. Find the average speed of the train when it just crosses the bridge.

CHEMISTRY

1. 1.5 g of impure sodium sulphate on treating with excess of barium chloride solution gives 1.74g BaSO_4 . What is the % purity of sodium sulphate in the sample?
2. 1.2g sample of impure sodium chloride on treatment with excess of AgNO_3 solution gave 2.4g AgCl . Calculate the % purity of sodium chloride sample.
3. 40% HCl by mass is ₹ 2 per kg. 80% H_2SO_4 by mass is ₹ 1 per kg. Now each acid is used to neutralise 28kg KOH . Which acid is cheaper?
4. A sample of chalk contains 96.5% CaCO_3 . Calculate the mass of this sample required to produce 5 litre CO_2 at STP. The sample is treated with excess of dil. H_2SO_4 .
5. Calculate the mass of 60% H_2SO_4 required to decompose 50 g of chalk (CaCO_3).

BIOLOGY

1. Who said 'Protoplasm is the physical basis of life'?
2. Who coined the term 'protoplasm'?
3. Name three most abundant elements in protoplasm.
4. Which biomolecule is the principal source of energy for our body?
5. Which sugar is present in ATP ?
6. What is the chemical formula of the glucose?
7. Name a non-reducing sugar
8. Give an example of unsaturated fatty acid?
9. Which biomolecule is the most concentrated source of stored energy?
10. Name the principle polysaccharide stored in human body.

MATH

1. If a relation $R = \{(-2, 1), (0, 2), (3, 1), (0, -1), (4, 2), (5, 1)\}$, then write its domain and range.
2. If $A = \{2, 3, 5\}$, $B = \{2, 4, 6\}$ and R is the relation from A to B defined by $R = \{(x, y) : x \in A, y \in B \text{ and } x < y\}$, then write R in the roster form.
3. If $A = \{1, 3, 5, 7, 8\}$ and $B = \{2, 3, 4, 6, 8, 10\}$ and R be the relation 'is one less than' from A to B , then write R in the roster form.
4. If $A = \{2, 3, 4\}$, $B = \{4, 6, 9, 10\}$ and $R = \{(x, y) : (x, y) \in A \times B \text{ such that } x \text{ is a factor of } y\}$, then write R in roster form.
5. Write the domain and the range of the relation $(x, y) : x = 3y$ and x and y are natural numbers less than 10.
6. Let $A = \{-2, -1, 0, 1, 2\}$, list the ordered pairs satisfying each of the following relations on A :
(i) 'is greater than'.
(ii) 'is the square of'.
(iii) 'is the negative of'.
7. If $A = \{1, 3, 5, 6\}$ and $B = \{3, 4, 5\}$, write the relation R as a set of ordered pairs if
(i) $R = \{(x, y) : (x, y) \in A \times B : x + y \text{ is even}\}$
(ii) $R = \{(x, y) : (x, y) \in A \times B : xy \text{ is odd}\}$.
8. Let $R = \{(x, y) : x, y \in \mathbb{Z}, y = 2x - 4\}$. If $(a, -2)$ and $(4, b^2)$ belong to R , find the values of a and b .
9. Find the linear relation between the components of the ordered pairs of the relation R where
(i) $R = \{(-1, -1), (0, 2), (1, 5), \dots\}$.
(ii) $R = \{(0, 2), (-1, 5), (2, -4), \dots\}$.
10. Let R be a relation from \mathbb{N} to \mathbb{N} defined by $R = \{(a, b) : a, b \in \mathbb{N} \text{ and } a = b^2\}$. Are the following true?
(i) $(a, a) \in R$ for all $a \in \mathbb{N}$
(ii) $(a, b) \in R$ implies $(b, a) \in R$