

NEW STANDARD ACADEMY

Date : 23-06-25

CLASS : 11TH

Marks: 60
Time: 3 hours.

PHYSICS

1. Write the dimensions of a/b in the relation $F = a\sqrt{x} + bt^2$ where F is the force, x is the distance and t is time.
2. The position of a particle moving along X-axis depends on time in accordance with the equation $x = at^2 + bt^3$, where x is in metre and t is in second. What are the units and dimensions of a and b ? What do these represent?
3. What are the respective number of significant figures for the numbers 23.023, 0.00003 and 2.1×10^{-3} ?
4. In the relation, $P = \frac{a}{b} \exp\left(\frac{-az}{\theta}\right)$ P is pressure, Z is distance and θ is temperature. What is the dimensional formula of b ?
5. Write dimensions of $\frac{c}{a \times b}$ in relation $y = a \cos \omega t + bt - c\sqrt{t}$ where y is displacement, t is time and ω is angular velocity.
6. What is the angle between two forces of 2N and 3N having resultant as 4N?
7. What is the angle of projection at which horizontal range and maximum height are equal?
8. Two forces 5kgwt and 10kgwt are acting with an inclination of 120° between them. What is the angle which the resultant makes with 10kgwt?
9. Why does the direction of motion of a projectile become horizontal at the highest point of its trajectory?
10. Find a unit vector parallel to the resultant of the vectors $\vec{A} = 2\hat{i} + 3\hat{j} + 4\hat{k}$ and $\vec{B} = 3\hat{i} + 5\hat{j} + \hat{k}$

CHEMISTRY

1. Calculate the number of oxygen atoms present in 88 g CO_2 . What would be the mass of CO having the same number of oxygen atom?
2. A glucose solution contains 9g of glucose ($\text{C}_6\text{H}_{12}\text{O}_6$). How many atoms of C, H and O are present in it?
3. Calculate the mass fraction and mole fraction of ethyl alcohol and water containing 9.2g alcohol and 18 g water
4. Calculate the mass of sodium acetate (CH_3COONa) required to make 500 mL of 0.375 molar aqueous solution. Molar mass of sodium acetate is $82.0245 \text{ g mol}^{-1}$.
5. Calculate the wave number of a radiation of wavelength of 5800 \AA .
6. The Vividh bharti station of All India Radio, broadcast at a frequency of 1368kHz. Calculate the wavelength of the electromagnetic radiation transmitted. Which part of the electromagnetic spectrum does it belong to?
7. Calculate the wavelength of a photon whose energy is 2 electron volt.
8. How many photons of wavelength 400 nm are necessary to provide one joule of energy?
9. Write the correct notations for the following (a) $n = 3, l = 1, m = -1$
10. Write the values of all the quantum numbers for the 20th electron in Cr(24).

BIOLOGY

1. (a) What is an enzyme?
(b) Give an example of Co-enzyme.
2. What is sugar? Give the name of sugar, present in milk?
3. Who proposed the Cell Theory? Explain the main points of this theory as it stands today.
4. What is nucleotide? Give the example

5. What are secondary proteins give the examples
6. (a) Apart from nucleus, which two other cell organelles have independent DNA ?
(b) What is the principal site of synthesis of ribosomal RNA ?
7. What is a chiasmata? Explain it
8. Draw label diagram of fluid mosaic model of plasma membrane
9. What is taxonomic Hierarchy give the example
10. Define (i) Diatoms (ii) Viroids

9. Prove that $\tan 50^\circ = \tan 40^\circ + 2\tan 10^\circ$
10. If $\tan \alpha = \frac{m}{m+1}$ and $\tan \beta = \frac{1}{2m+1}$,
show that $\alpha + \beta = \frac{\pi}{4}$

MATH

1. Let $T = \left\{ x : \frac{x+5}{x-7} - 5 = \frac{4x-40}{13-x} \right\}$. Is T an empty set ? justify your answer.
2. In a survey of 60 people, it was found that 21 people liked product A, 26 liked product B and 29 liked product C. If 14 people liked products A and B, 12 people liked product C and A, 14 people liked product B and C and 8 people liked all the three products find
 - (i) How many people liked product C only?
 - (ii) How many people like at least one of the three products?
3. Given $B = \{2, 3, 5\}$ and some elements of $A \times B$ are $(a, 2), (b, 3), (c, 5)$. Find the set A and the remaining ordered pairs of $A \times B$ such that $A \times B$ is least.
4. 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) $R = \{(x, y) : (x, y) \in A \times B : xy \text{ is odd}\}$.
5. Convert the following into radian measures:
 - (i) 25°
 - (ii) $5^\circ 37' 30''$
6. Taking the moon's distance from the earth as 360000 km and the angle subtended by the moon at any point O on the earth as half a degree, estimate the diameter of the moon.
7. Find the values of the following:
 - (i) $\tan \frac{25\pi}{4}$
 - (ii) $\sec \frac{5\pi}{3}$
8. Find the other five trigonometric functions if $\cos x = -\frac{1}{2}$ and x lies in the third quadrant