NEW STANDARD ACADEMY

Marks: 60

Date : 30-06-25 **CLASS : 11TH** **Time: 3 hours.**

PHYSICS

1. How many significant figures are there in the number 0.004560? Justify your answer.
2. The radius of a sphere is measured as r = 7.00 ± 0.01cm. Find the percentage error in the calculation of its volume.
3. If time period of a pendulum is given by $T=2\pi\sqrt{(l/g)}$, check its dimensional correctness.
4. A physical quantity X is given by $X=\frac{(a^2b)}{\sqrt{c}}$, where a, b, c have errors of 1%, 2%, and 4% respectively. Find the percentage error in X.
5. Write the dimensional formula of pressure and energy. Are they dimensionally the same?
6. Differentiate between distance and displacement with a situation where displacement is zero but distance is non-zero.
7. A body moving along a straight line covers distances 10 m, 20 m, and 30 m in 1st, 2nd, and 3rd second respectively. Is the motion uniform? Justify.
8. The displacement of a particle is given by $x=3t^2+2t+1$. Find the velocity and acceleration at t=2s.
9. A person walks 3 km east, then 4 km west. What is the distance and what is the displacement?
10. A body covers first 10 m in 2 s and next 10 m in 4 s. Is the acceleration uniform? Justify with calculation

CHEMISTRY

1. Calculate the number of atoms in 0.5 mole of Mg.
2. A sample of compound contains 4.8 g of oxygen and 1.2 g of hydrogen. Find the empirical formula.
3. How many molecules are present in 36 g of water?
4. A compound contains 40% carbon, 6.7% hydrogen, and 53.3% oxygen. Determine the empirical formula.
5. Calculate the wavelength of an electron moving with a velocity of 2.05×10^6 m/s. (Given: $m_e = 9.1 \times 10^{-31}$ kg)
6. Explain the dual nature of matter. How does it support de Broglie's hypothesis?
7. How does the energy of orbitals vary in multi-electron atoms? Why is this different from hydrogen atom?
8. Explain the concept of quantized energy levels using Bohr's model.
9. Give reasons: Cation is smaller than its parent atom, while anion is larger.
10. Why does the atomic radius increase down the group but decrease across the period?

BIOLOGY

1. Differentiate between prokaryotic and eukaryotic cells based on genetic material and membrane-bound organelles.
2. Why is the nucleus called the control center of the cell? Explain with two functions.
3. How do lysosomes maintain intracellular digestion? Mention the significance of acid hydrolases.
4. Explain the fluid mosaic model of the plasma membrane. Why is it termed 'fluid' and 'mosaic'?
5. Why are mitochondria called semi-autonomous organelles? Give two reasons.
6. Why is the S-phase of interphase significant for cell division? Explain.
7. Compare anaphase of mitosis and anaphase I of meiosis with one similarity and one difference.
8. How does cytokinesis differ in plant and animal cells? Explain with structural reasons.
9. Mention two key differences between meiosis I and meiosis II.
10. What is a Endomembrane system? Give the name of oreganelle in this system

MATHS

1. If U is the universal set with 100 elements A and B are two sets such that n(A) = 50, n(B)= 60, $n(A\cap B) = 20$ *then* $n(A' \cap B') =$
2. If S={x|x is a positive multiple of 3 and less than 100} and P= {x|x is a prime number less than 20}. Then *n(S) +n(P)* is equal

3. In a forest camp of 840 persons, 450 persons can speak Hindi.300 can speak English and 200 can speak both. The number of persons who can speak neither language is
4. A Survey shows that 63% of the people watch a News channel whereas 76% watch another channel. If x% of the people watch both channels then x is
5. If A is the set of even natural numbers less than 8 and B is the set of prime numbers less than 7, then find the number of relations from A toB.
6. Find the domain and the range of the following functions:

   (i) $f(x) = \sqrt{x+2}$

   (ii) $f(x) = \frac{x^2-9}{x-3}$.
7. *If* $f(x) = log\left(\frac{1+x}{1-x}\right)$, *then show that* $f(x) + f(y) = f\left(\frac{x+y}{1+x\,y}\right)$.
8. *Find the domain of the function* $f(x)\ \frac{1}{\log(1-x)} + \sqrt{x+3}$.
9. If the domain of the function $f(x) = \frac{1}{\sqrt{10+3x-x^2}} + \frac{1}{\sqrt{x+|x|}}$ *is*(a,b) then $(1+a)^2+b^2$ is equal to:
10. If$f: R^+ \to R$ *is defined by* $f(x) = \log_e x$, where R^+ is the set of positive real numbers , then find

    (i) range of f

    (ii) x such thatf(x) = -1.