NEW STANDARD ACADEMY

Marks: 60

Date : 05-05-25 **CLASS : 11TH** **Time: 3 hours.**

PHYSICS

1. The velocity of a body is given by the equation $v = \frac{b}{t} + ct^2 + dt^3$ the dimensional formula of b is?
2. The force F is given in terms of time t and displacement x by the equation F= A cos Bx + C sin Dt. The dimensional formula of D/B is?
3. Find dimensions of a/b in the equation P= $\frac{a-t^2}{bx}$ where P is pressure x is distance and t is time.
4. Find dimensions of a/b is relation P = $\frac{a-x^2}{bx}$, where x is distance P is pressure.
5. Write dimension of a and b in relation P = $\frac{a-x^2}{bt}$, where P is power x is distance and t is time.
6. Obtain an expression for centripetal force (F) acting on a particle of mass (m) moving with velocity (v) in a circle of radius (r) then prove dimensionally.

$$F \propto \frac{mv^2}{r}$$

7. Reynolds number (a dimensionless quantity) determines the condition of laminar flow of a viscous liquid through a pipe is function of the density of the liquid (ρ) its average speed (u) and coefficient of viscosity (η). N_R is also proportional to diameter of pipe (D). Show from dimensional considerations

$$N_R \propto \frac{\rho u D}{\eta}.$$

8. The frequency (ν) of an oscillating drop may depend on the radius of the drop (r), density of the liquid (ρ) and surface tension of liquid (S). Then show dimensionally

$$\nu = K\sqrt{\frac{S}{\rho r^3}}$$

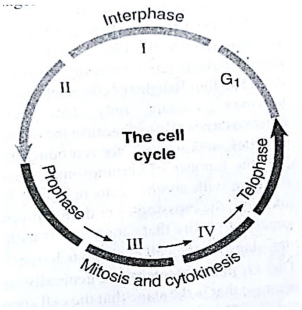
9. Derive by the method of dimensions, an expression for the escape velocity (ϑ) of a body, assuming that velocity depends on *(i)* radius of the planet (R) and *(ii)* acceleration due to gravity (g)
10. The kinetic energy possessed by a body depends upon its (i) mass (m) (ii) speed (ϑ). Find the expression for kinetic energy of body using the method of dimensions.

CHEMISTRY

1. Mass of 5.6 litre of a gas at STP is 8 g. Calculate its molecular mass.
2. An organic compound contains 4% sulphur Calculate its minimum molecular mass of organic compound.
3. How many atoms of Na, C and O are present in 0.5 mole of Na_2CO_3?
4. Find the ratio of number of molecules contained in 1 g NH_3 and 1gN_2.
5. 0.45 grams of anhydrous oxalic acid require 50mL $KMnO_4$ solution for complete oxidation in acid medium .What is the normality of $KMnO_4$ Solution.
6. Molar mass of an acid is 90 .0.75 gram of this acid require 16.6 mL for complete neutralisation. Calculate the basicity of the acid.
7. What is the mole fraction of the solute in 2.5 m aqueous solution?
8. Calculate the percentage of all the elements present in $MgSO_4$.
9. In an organic compound, the mass % of C, H and N is 40.57, 8.53 and 23.65 respectively and rest is oxygen. The molar mass of the compound is 59, what is its molecular formula?
10. In an organic compound, C = 40%, H = 6.6 % and O=53.4% .If the V.D of the organic compound is 30 what is its molecular formula?

BIOLOGY

1. Distinguish cytokinesis from karyokinesis
2. Describe the events taking place during interphase.
3. What is G_0(quiescent phase) of cell cycle?
4. Why is mitosis called equational division?
5. How does cytokinesis in plant cells differ from that in animal cells?
6. What is the proper sequence of stages in mitosis?
7. What is mitosis? What is its importance?
8. What are the differences between astral and anastral mitosis?
9. Identify stages I-IV.



10. Name the stage of cell cycle at which one of the following events occur :
(i) Chromosomes are moved to spindle equator.
(ii) Centromere splits and chromatids separate.
(iii) pairing between homologous chromosomes takes place.
(iv) Crossing over between homologous chomosomes takes place.

MATH

1. Write the set in the Roster form
A={x;x is a two digit number such that the sum of its digits is 9}
2. Write the set in the Roster form
P = {x|x is a positive integer less than 10 and 2^x-1 is an odd integer}
3. Let T $\left\{x: \frac{x+5}{x-7} - 5 = \frac{4x-40}{13-x}\right\}$. Is T an empty set? Justify your answer.
4. Write sets in the builder form:A= $\left\{\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \ldots, \frac{9}{10}\right\}$.
5. Write sets in the builder form:B=$\left\{1, \frac{1}{4}, \frac{1}{9}, \frac{1}{16}, \frac{1}{25}, \ldots.\right\}$
6. If S = $\{x: x \text{ is a positive multiple of } 3 \text{ less than } 100\}$
And P = $\{x: x \text{ is a prime number less than } 20\}$,
then write n(S) +n(P).
7. State which of the give collection of objects is a set:
(i) A collection of popular cinema actors of India.
(ii) The collection of even natural numbers less than 51.
(iii) The collection of counting less than 1.
(iv) Collection of interesting books written by Shakespeare.
8. Use the roster method to represent the following sets:
(i) The set of all natural number x for which x+6 is less than 10.
(ii) $\{x: x \in, Z \text{ and } x^2 < 16\}$.
9. Write the following seta in the builder form:
(i) {5,25,125,625} (ii) {1,4,9, … ,100}
10. Find the cardinal number of the following sets:
(i) {} (ii) {0} (iii) A= {1,2,2,1,3}