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**Std- X [English Medium]****Algebra :****1. ARITHMETIC PROGRESSION :**

• Introduction to Sequence • Arithmetic Progression (A.P) and Geometric Progression (G.P.) • General term of an A.P. and G.P. • Sum of the first 'n' terms of an A.P. and G.P. • Arithmetic Mean and Geometric Mean.

**2. QUADRATIC EQUATIONS :**

• Introduction to quadratic equations • Solutions of quadratic equations • Nature of roots based on discriminant • Relation between roots of the equation and coefficient of the equation • Equations reducible to quadratic form.

**3. LINEAR EQUATIONS IN TWO VARIABLES :**

• System of linear equations in two variables • Algebraic methods of solving linear equations in two variables • Graphical representation of different possibilities of solutions inconsistency • Graphical method of solving a system of linear equations • Determinant of order two • Cramer's rule • Consistency of pair of linear equations.

**4. PROBABILITY :**

• Introduction to probability and related terms • Classical definition of probability • Types of events • Equally likely outcomes • Probability of an event • Properties of Probability • Addition theorem (without proof)

**5. STATISTICS :**

• Brief revision of Tabulation of data, inclusive and exclusive type of tables • Mean, median and mode of grouped data • Histograms, frequency polygon, frequency curve, pie diagram • Ogives (Cumulative frequency graphs) • Applications of ogives in determination of median • Relation between measures of central tendency • Introduction to normal distribution • Properties of normal distribution.

**Geometry :****1. SIMILARITY :**

• Properties of ratios of areas of two triangles • Basic proportionality theorem • Introduction to similarity • Similar triangles • Areas of two similar triangles • Similarity in right angled triangles • Pythagoras theorem and its converse •  $30^{\circ}$ - $60^{\circ}$ - $90^{\circ}$  theorem and  $45^{\circ}$ - $45^{\circ}$ - $90^{\circ}$  theorem • Application of Pythagoras theorem in acute and obtuse angle • Appolonius theorem

**2. CIRCLE :**

• Tangents and its properties • Theorem - Tangent at any point to the circle is perpendicular to the radius and its converse • Number of tangents from a point to a circle • Theorem - The length of two tangent segments drawn from a point outside the circle are equal • Touching circles • Introduction to an arc • Angle subtended by the arc to the centre and to the point on the circle • Cyclic quadrilateral • Tangent - Secant theorem

**3. CO-ORDINATE GEOMETRY :**

- Slope of a line • Intercepts made by a line • Standard forms of equation of a line • General equation of a line.

**4. GEOMETRIC CONSTRUCTIONS :**

- Division of line segment in a given ratio • Basic geometric constructions
- Construction of tangent to the circle from the point on the circle and out side the circle • Construction of tangent without using centre • Construction of triangle, If the base, angle opposite to it and either median or altitude is given
- Construction of a triangle similar to a given triangle

**5. TRIGONOMETRY :**

- Angles in standard position • Trigonometric ratios in terms of coordinates of point • Trigonometric Identities (with proof)  $\sin(-\theta) = -\sin\theta$   $\cos(-\theta) = \cos\theta$
- Use of basic identities and their applications • Problems on height and distance

**6. MENSURATION :**

- Length of an arc • Area of the sector • Area of a Circular Segment • Euler's formula • Surface area and volume of cuboids Spheres, hemispheres, right circular cylinders, cones, frustum of a cone • Problems based on areas and perimeter/circumference of a circle, sector and segment of a circle • Problems on finding surface areas and volumes of combinations of any two of the following : cuboids, spheres, hemispheres and right circular cylinders/cones • Problems involving converting one type of metallic solid into another.

***Science and Technology :*****1. MATERIALS :**

- 1.1 Acids and Bases : Acids, Bases and Salts : General properties, examples and uses.
- 1.2 Chemical Reaction : Types of chemical reactions : combination, decomposition, displacement, double decomposition, precipitation, and neutralization.
- 1.3 Oxidation and Reduction : Oxidation and Reduction in terms of gain and loss of oxygen and hydrogen.
- 1.4 Metals and Non-Metals : Brief discussion on basic metallurgical processes. Properties of common metals, Elementary idea about bonding.
- 1.5 Carbon Compounds : Elementary idea about bonding. Saturated hydrocarbons, alcohols, carboxylic acids (properties only)
- 1.6 Common chemicals used in daily life : Soap, common salt, Washing Soda, Baking soda, bleaching powder, Plaster of Paris.
- 1.7 Classification of Elements : Brief historical account, Mendeleev's periodic table, gradation in properties.

**2. THE WORLD OF THE LIVING :**

- 2.1 Life Process : Definition of "Living things". Basic concept of nutrition, respiration, transport and excretion in plants and animals.
- 2.2 Control in the Living : Tropic movements in plants. Introduction to plant hormones; control and coordination in animals; voluntary, involuntary and reflex action, nervous system, chemical coordination, animal hormones.

- 2.3 Reproduction in the Living : Reproduction in plants and animals. Need for and methods of family planning. Safe Sex vs-HIV/AIDS. Child bearing and women's health.
- 2.4 Heredity and Evolution : Heredity, origin of life-brief introduction, Basic concept of evolution.

### **3. MOVING THINGS, PEOPLE AND IDEAS :**

- 3.1 Electric Circuits : Potential and potential difference. Ohm's Law, Resistances in series and parallel. Power dissipated due to current. Inter relation between P,V,I and R.
- 3.2 Magnets : Magnetic field, field lines. Field due to a current carrying wire, coil, solenoid. Force on current carrying conductor. Fleming's Left Hand Rule. Electric motor, electromagnetic induction. Induced potential differences, induced current. Electric generator, principle and working. Direct and Alternating current. Frequency of AC. Advantage of AC over DC. Domestic Electric Circuits.

### **4. NATURAL PHENOMENA :**

- 4.1 Light : Convergence and Divergence of Light
- 4.2 Spherical Mirrors : Images formed by a concave mirror. Related concepts : centre of curvature, principal axis, optical centre, focus, focal length.
- 4.3 Refraction : Refraction, appreciation of the concept of refraction. Laws of refraction. Velocity of light. Refractive index, twinkling of stars, dispersion of light. Scattering of light.
- 4.4 Lenses : Images formed by a convex lens; functioning of the lens in the human problems of vision and their remedies. Application of spherical mirrors and lenses.

### ***List of Experiments :***

- To find the pH of the following samples by using pH paper/universal indicator.
  - Dilute Hydrochloric acid
  - Dilute NaOH solution
  - Dilute Ethanoic acid solution
  - Lemon juice
  - Water
  - Dilute sodium bicarbonate solution.
- To study, the properties of acids and bases HCl and NaOH by their reaction with
  - Litmus solution (Blue/Red)
  - Zinc metal
  - Solid sodium carbonate
- To determine the focal length of
  - Concave mirror
  - Convex lens by obtaining the image of a distant object.
- To trace the path of a ray of light passing through a rectangular glass slab for different angles of incidence.  
Measure the angle of incidence, angle of refraction, angle of emergence and interpret the result.

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5. To study the dependence of current (I) on the potential difference (V) across a resistor and determine its resistance. Also plot a graph between V and I.
  6. To determine the equivalent resistance of two resistors when connected in series.
  7. To determine the equivalent resistance of two resistors when connected in parallel.
  8. To prepare a temporary mount of a leaf peel to show stomata.
  9. To show experimentally that light is necessary for photosynthesis.
  10. To show experimentally that carbon dioxide is given out during respiration.
  11. To study (a) binary fission in Amoeba and (b) budding in yeast with the help of prepared slides.
  12. To determine the percentage of water absorbed by raisins.
  13. To perform and observe the following reactions and classify them into;
    - i) Combination Reaction
    - ii) Decomposition Reaction
    - iii) Displacement Reaction
    - iv) Double Displacement Reaction
      1. Action of water on quick lime.
      2. Action of heat on Ferrous Sulphate crystals.
      3. Iron Nails kept in copper sulphate solution.
      4. Reaction between Sodium sulphate and Barium chloride solutions.
  14.
    - a) To observe the action of Zn, Fe, Cu and Al metals on the following salt solutions.
      - i)  $\text{ZnSO}_4$  (aq.)
      - ii)  $\text{FeSO}_4$  (aq.)
      - iii)  $\text{CuSO}_4$  (aq.)
      - iv)  $\text{Al}_2(\text{SO}_4)_3$  (aq.)
    - b) Arrange Zn, Fe, Cu and Al metals in the decreasing order of reactivity based on the above result.
  15. To study the following properties of acetic acid (ethanoic acid) :
    - i) odour
    - ii) solubility in water
    - iii) effect on litmus
    - iv) reaction with sodium bicarbonate

