

# L\_2\_General\_Ed

## I. MATHEMATICS

### UNIT I: NUMBER SYSTEMS

#### REAL NUMBERS

Euclid's division lemma, Fundamental Theorem of Arithmetic - statements after reviewing work done earlier and after illustrating and motivating through examples, Proofs of results - irrationality of  $\sqrt{2}$ ,  $\sqrt{3}$ ,  $\sqrt{5}$ , decimal expansions of rational numbers in terms of terminating/non-terminating recurring decimals.

### UNIT II: ALGEBRA

#### POLYNOMIALS

Zeros of a polynomial. Relationship between zeros and coefficients of quadratic polynomials. Statement and simple problems on division algorithm for polynomials with real coefficients.

#### PAIR OF LINEAR EQUATIONS IN TWO VARIABLES

Pair of linear equations in two variables and their graphical solution. Geometric representation of different possibilities of solutions/inconsistency.

Algebraic conditions for number of solutions. Solution of a pair of linear equations in two variables algebraically - by substitution, by elimination and by cross multiplication. Simple situational problems must be included. Simple problems on equations reducible to linear equations may be included.

### UNIT III: GEOMETRY

#### TRIANGLES

Definitions, examples, counter examples of similar triangles.

1. (Prove) If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.
2. (Motivate) If a line divides two sides of a triangle in the same ratio, the line is parallel to the third side.
3. (Motivate) If in two triangles, the corresponding angles are equal, their corresponding sides are proportional and the triangles are similar.
4. (Motivate) If the corresponding sides of two triangles are proportional, their corresponding angles are equal and the two triangles are similar.
5. (Motivate) If one angle of a triangle is equal to one angle of another triangle and the sides

including these angles are proportional, the two triangles are similar.

6. (Motivate) If a perpendicular is drawn from the vertex of the right angle of a right triangle to the hypotenuse, the triangles on each side of the perpendicular are similar to the whole triangle and to each other.
7. (Prove) The ratio of the areas of two similar triangles is equal to the ratio of the squares on their corresponding sides.
8. (Prove) In a right triangle, the square on the hypotenuse is equal to the sum of the squares on the other two sides.
9. (Prove) In a triangle, if the square on one side is equal to sum of the squares on the other two sides, the angles opposite to the first side is a right triangle.

## **UNIT IV: TRIGONOMETRY**

### **1. INTRODUCTION TO TRIGONOMETRY**

Trigonometric ratios of an acute angle of a right-angled triangle. Proof of their existence (well defined); motivate the ratios, whichever are defined at  $0^\circ$  &  $90^\circ$ . Values (with proofs) of the trigonometric ratios of  $30^\circ$ ,  $45^\circ$  &  $60^\circ$ . Relationships between the ratios.

### **2. TRIGONOMETRIC IDENTITIES**

Proof and applications of the identity  $\sin^2 A + \cos^2 A = 1$ . Only simple identities to be given. Trigonometric ratios of complementary angles.

## **UNIT VII: STATISTICS AND PROBABILITY**

### **1. STATISTICS**

Mean, median and mode of grouped data (bimodal situation to be avoided). Cumulative frequency graph.

## **UNIT II: ALGEBRA (Contd.)**

### **QUADRATIC EQUATIONS**

Standard form of a quadratic equation  $ax^2 + bx + c = 0$ , ( $a \neq 0$ ). Solution of the quadratic equations (only real roots) by factorization, by completing the square and by using quadratic formula. Relationship between discriminant and nature of roots.

Problems related to day to day activities to be incorporated.

### **ARITHMETIC PROGRESSIONS**

Motivation for studying AP. Derivation of standard results of finding the  $n$ th term and sum of first  $n$  terms and their application in solving daily life problems.

## **UNIT III : GEOMETRY (Contd.)**

### **2. CIRCLES**

Tangents to a circle motivated by chords drawn from points coming closer and closer to the point.

1. (Prove) The tangent at any point of a circle is perpendicular to the radius through the point of contact.
2. (Prove) The **lengths** of tangents drawn from an external point to circle are equal.

### **CONSTRUCTIONS**

1. Division of a line segment in a given ratio (internally)
2. Tangent to a circle from a point outside it.
3. Construction of a triangle similar to a given triangle.

## **UNIT IV: TRIGONOMETRY**

### **HEIGHTS AND DISTANCES**

Simple and believable problems on heights and distances. Problems should not involve more than two right triangles. Angles of elevation / depression should be only  $30^\circ$ ,  $45^\circ$ ,  $60^\circ$ .

## **UNIT V : STATISTICS AND PROBABILITY**

### **PROBABILITY**

Classical definition of probability. Connection with probability as given in Class IX. Simple problems on single events, not using set notation.

## **UNIT VI: COORDINATE GEOMETRY**

### **LINES (In two-dimensions)**

Review the concepts of coordinate geometry done earlier including graphs of linear equations. Awareness of geometrical representation of quadratic polynomials. Distance between two points and section formula (internal). Area of a triangle.

## **UNIT VII: MENSURATION**

### **AREAS RELATED TO CIRCLES**

Motivate the area of a circle; area of sectors and segments of a circle. Problems based on areas and perimeter / circumference of the above said plane figures. (In calculating area of segment of a circle, problems should be restricted to central angle of  $60^\circ$ ,  $90^\circ$  &  $120^\circ$  only. Plane figures involving triangles, simple quadrilaterals and circle should be taken.)

## **SURFACE AREAS AND VOLUMES**

1. Problems on finding surface areas and volumes of combinations of any two of the following: cubes, cuboids, spheres, hemispheres and right circular cylinders/cones. Frustum of a cone.
2. Problems involving converting one type of metallic solid into another and other mixed problems. (Problems with combination of not more than two different solids be taken.)

## **II SCIENCE**

### **THEME: MATERIALS**

#### **UNIT: CHEMICAL SUBSTANCES - NATURE AND BEHAVIOUR**

1. **Chemical reactions:** Chemical Equation, Balanced chemical equation, implications of a balanced chemical equation, types of chemical reactions: combination, decomposition, displacement, double displacement, precipitation, neutralization, oxidation and reduction.
2. **Acids, bases and salts :** Their definitions in terms of furnishing of H<sup>+</sup> and OH<sup>-</sup> ions, General properties, examples and uses, concept of pH scale(Definition relating to logarithm not required), importance of pH in everyday life; preparation and uses of sodium hydroxide, Bleaching powder, Baking soda, washing soda and Plaster of Paris.
3. **Metals and non metals:** Properties of metals and non-metals, reactivity series, formation and properties of ionic compounds, basic metallurgical processes, corrosion and its prevention

### **THEME: THE WORLD OF THE LIVING**

#### **UNIT: WORLD OF LIVING**

1. **Life Processes:** "living being". Basic concept of nutrition, respiration, transport and excretion in plants and animals.
2. **Control and Co-ordination in Animals and Plants:** Tropic movements in plants; Introduction to plant hormones; control and co-ordination in animals, nervous system; voluntary, involuntary and reflex action, chemical co-ordination: animal hormones.

### **THEME : HOW THINGS WORK.**

#### **UNIT: EFFECTS OF CURRENT**

Electric current, potential difference and electric current. Ohm's law; Resistance, Resistivity, Factors on which the resistance of a conductor depends. Series combination of resistors, parallel

combination of resistors and its applications in daily life. Heating effect of Electric current and its applications in daily life. Electric Power, Inter relation between P, V, I and R.

Magnetic effects of current : Magnetic field, field lines, field due to a current carrying conductor, field due to current carrying coil or solenoid; Force on current carrying conductor, Fleming's left hand rule. Electro magnetic induction. Induced potential difference, Induced current. Fleming's Right Hand Rule, Direct current. Alternating current : frequency of AC. Advantage of AC over DC. Domestic electric circuits.

### **THEME : NATURAL RESOURCES**

**Sources of energy:** Different forms of energy, conventional and non-conventional sources of energy: fossil fuels, solar energy; biogas; wind, water and tidal energy; nuclear energy. Renewable versus non-renewable sources.

### **THEME: MATERIALS**

#### **UNIT: CHEMICAL SUBSTANCES - NATURE AND BEHAVIOUR**

**Carbon compounds:** Covalent bonding in carbon compounds. Versatile nature of carbon. Homologous series Nomenclature of carbon compounds containing functional groups (halogens, alcohol, ketones, aldehydes, alkanes and alkynes), difference between saturated hydrocarbons and unsaturated hydrocarbons. Chemical properties of carbon compounds (combustion, oxidation, addition and substitution reaction). Ethanol and Ethanoic acid (only properties and uses), soaps and detergents.

**Periodic classification of elements:** Need for classification, Modern Periodic table, gradation in Properties, valency, Atomic number, metallic and non-metallic properties.

### **THEME: THE WORLD OF THE LIVING**

#### **UNIT: WORLD OF LIVING**

**Reproduction:** Reproduction in animal and plants (asexual and sexual) reproductive health-need for and methods of family planning. safe sex vs HIV/AIDS. Child bearing and women's health..

**Heredity and evolution:** Heredity; Mendel's contribution- Laws for inheritance of traits: Sex determination: brief introduction; Basic concepts of evolution.

### **THEME: NATURAL PHENOMENA**

#### **UNIT:**

Reflection of light at curved surfaces, Images formed by spherical mirrors, centre of curvature, principal axis, principal focus, focal length. Mirror Formula (Derivation not required), Magnification.

Refraction; laws of refraction, refractive index.

Refraction of light by spherical lens, Image formed by spherical lenses, Lens formula (Derivation not required), Magnification. Power of a lens; Functioning of a lens in human eye, defects of vision and their corrections, applications of spherical mirrors and lenses.

Refraction of light through a prism, dispersion of light, scattering of light, applications in daily life.

## **THEME: NATURAL RESOURCES**

### **UNIT: CONSERVATION OF NATURAL RESOURCES**

Management of natural resources. Conservation and judicious use of natural resources. Forest and wild life, coal and petroleum conservation. Examples of People's participation for conservation of natural resources.

The Regional environment : Big dams : advantages and limitations; alternatives if any. Water harvesting. Sustainability of natural resources.

Our environment : Eco-system, Environmental problems, Ozone depletion, waste production and their solutions. Biodegradable and non-biodegradable, substances.

### III SOCIAL STUDY

#### **UNIT I: INDIA AND THE CONTEMPORARY WORLD – II**

##### **Themes**

In Sub-unit 1.1 students are required to choose any two themes. In that sub-unit, theme 3 is compulsory and for second theme students are required to choose any one from the first two themes. In Sub Units 1.2 and 1.3 students are required to choose any one theme from each. Thus all students are required to study four themes in all.

##### **Sub-unit 1.1: Events and processes:**

Any two of the following themes:

1. **Nationalism in Europe:**
  - (a) The growth of nationalism in Europe after the 1830s.
  - (b) The ideas of Giuseppe Mazzini etc.
  - (c) General characteristics of the movements in Poland, Hungary, Italy, Germany and Greece. (Chapter 1)
  
2. **Nationalist Movement in Indo China:**

Factors leading to growth of rationalism in India

  - (a) French colonialism in Indochina.
  - (b) Phases of struggle against the French.
  - (c) The ideas of Phan Dinh Phung, Phan Boi Chau, Nguyen Ac Quoc
  - (d) The second world war and the liberation struggle.
  - (e) America and the second Indochina war.(Chapter 2)
  
3. **Nationalism in India: Civil Disobedience Movement**
  - (a) First world war, Khilafat and Non-Cooperation.
  - (b) Salt Satyagraha.
  - (c) Movements of peasants, workers, tribals.
  - (d) Activities of different political groups. (Chapter 3)
  
4. **Mapwork based on theme 3 only.**

##### **Sub-unit 1.2: Economies and livelihoods:**

Any one of the following themes:

###### **Industrialization 1850s - 1950s:**

- (a) Contrast between the form of industrialization in Britain and India.
  - (b) Relationship between handicrafts and industrial production, formal and informal sectors.
  - (c) Livelihood of workers. Case studies: Britain and India. (Chapter 4)
- 
1. **Urbanization and urban lives:** (a) Patterns of urbanization (b) Migration and the growth of towns. (c) Social change and urban life. (d) Merchants, middle classes, workers and urban poor. (Chapter 5) Case studies : London and Bombay in the nineteenth and twentieth century.

2. **Trade and Globalization:** (a) Expansion and integration of the world market in the nineteenth and early twentieth century. (b) Trade and economy between the two Wars. (c) Shifts after the 1950s. (d) Implications of globalization for livelihood patterns. Case study : The post War International Economic order, 1945 to 1960s. (Chapter 6)

### **Sub-unit 1.3: Culture, Identity and Society Any one of the following themes:**

1. **Print culture and nationalism.** (a) The history of print in Europe. (b) The growth of press in nineteenth century India. (c) Relationship between print culture, public debate and politics.
2. **History of the novel:** (a) Emergence of the novel as a genre in the west. (b) The relationship between the novel and changes in modern society. (c) Early novels in nineteenth century India. (d) A study of two or three major writers. (Chapter 8)

## **UNIT 2: INDIA - RESOURCES AND THEIR DEVELOPMENT**

### **Themes**

1. **Resources:** Types - natural and human; Need for resource planning. (Chapter 1)
2. **Natural Resources :** Land as a resource, soil types and distribution; changing land-use pattern; land degradation and conservation measures.(Chapter 1)
3. **Forest and Wild life resources:** Types and distribution ,depletion of flora and fauna; conservation and protection of forest and wild life. (Chapter 2)
4. **Water resources:** Sources, distribution, utilisation, multi-purpose projects, water scarcity, need for conservation and management, rainwater harvesting. (One case study to be introduced) (Chapter 3)
5. **Agriculture:** Types of farming, major crops, cropping pattern, technological and institutional reforms; their impact; contribution of Agriculture to national economy - employment and output. (Chapter 4)]
6. **Mineral Resources :** Types of minerals, distribution, use and economic importance of minerals, conservation. (Chapter 5)
7. **Power Resources:** Types of power resources: conventional and non-conventional, distribution and utilization, and conservation. (Chapter 6)
8. **Manufacturing Industries:** Types, spatial distribution, contribution of industries to the national economy, industrial pollution and degradation of environment, measures to control degradation. (One case study to be introduced) (Chapter 7)
9. Transport, communication and trade(Chapter 8)

### **Map Work**

#### **Project / Activity**

- Learners may collect photographs of typical rural houses, and clothing of people from different regions of India and examine whether they reflect any relationship with climatic conditions and relief of the area.
- Learners may write a brief report on various irrigation practices in the village and the change in cropping pattern in the last decade.

#### **Posters**

- Pollution of water in the locality.



- Depletion of forests and the greenhouse effect.

**Note :** Any similar activities may be taken up.

### UNIT 3: DEMOCRATIC POLITICS II

#### Themes

1. Power sharing mechanisms in democracy Why and how is power shared in democracies? How has federal division of power in India helped national unity? To what extent has decentralisation achieved this objective? How does democracy accommodate different social groups? (Chapter 1&2)
2. Working of Democracy are divisions inherent to the working of democracy? What has been the effect of caste on politics and of politics on caste? How has the gender division shaped politics? How do communal divisions affect democracy? (Chapter 3&4)
3. Competition and contestations in democracy How do struggles shape democracy in favour of ordinary people? What role do political parties play in competition and contestation? Which are the major national and regional parties in India? Why have social movements come to occupy large role in politics? (Chapter 5&6)
4. Outcomes of democracy Can or should democracy be judged by its outcomes? What outcomes can one reasonably expect of democracies? Does democracy in India meet these expectations? Has democracy led to development, security and dignity for the people? What sustains democracy in India? (Chapter 7)
5. Challenges to democracy Is the idea of democracy shrinking? What are the major challenges to democracy in India? How can democracy be reformed and deepened? What role can an ordinary citizen play in deepening democracy? (Chapter 8)

### UNIT 4: UNDERSTANDING ECONOMIC DEVELOPMENT-II

#### Themes

1. **The Story of Development:** The traditional notion of development; National Income and Per- capita Income. Growth of NI - critical appraisal of existing development indicators (PCI, IMR, SR and other income and health indicators) The need for health and educational development; Human Development Indicators (in simple and brief as a holistic measure of development. The approach to this theme : Use case study of three states (Kerala, Punjab and Bihar) or take a few countries (India, China, Sri Lanka and one developed country) (Chapter 1)
2. **Sectors of the Indian Economy :** Sectors of Economic Activities; Historical change in sectors; Rising importance of tertiary sector; Employment Generation; Division of Sectors-Organised and Unorganised; Protective measures for unorganised sector workers. (Chapter 2)
3. **Money and Credit: Role of money in an economy :** Historical origin; Formal and Informal financial institutions for Savings and Credit - General Introduction; Select one formal institution such as a nationalized commercial bank and a few informal institutions; Local money lenders, landlords, self help groups, chit funds and private finance companies. (Chapter 3)
4. **Globalisation:** What is Globalisation (through some simple examples); How India is being globalised and why ; Development Strategy prior to1991. State Control of

Industries Textile goods as an example for elaboration; Economic Reforms 1991; Strategies adopted in Reform measures (easing of capital flows; migration, investment flows); Different perspectives on globalisation and its impact on different sectors; Political Impact of globalisation. (Chapter 4)

5. **Consumer Awareness :** How consumer is exploited (one or two simple case studies) factors causing exploitation of consumers; Rise of consumer awareness; how a consumer should be in a market; role of government in consumer protection (Chapter 5)

## **SUGGESTED ACTIVITIES**

### **Theme 2:**

Visit to banks and money lenders / pawnbrokers and discuss various activities that you have observed in banks in the classroom;

### **Theme 3:**

Participate in the meetings of self help groups, which are engaged in micro credit schemes in the locality of learners and observe issues discussed.

### **Theme 4:**

Provide many examples of service sector activities. Use numerical examples, charts and photographs.

### **Theme 5:**

Collect logos of standards available for various goods and services. Visit a consumer court nearby and discuss in the class the proceedings; Collect stories of consumer exploitation and grievances from news papers and consumer courts.

## **UNIT 5: DISASTER MANAGEMENT (Through Formative Assessment only)**

1. Tsunami
2. Safer Construction Practices.
3. Survival Skills.
4. Alternate Communication systems during disasters.
5. Sharing Responsibility

### **Prescribed Textbooks:**

1. India and the Contemporary World-II (History) - Published by NCERT
2. Contemporary India II (Geography) - Published by NCERT
3. Democratic Politics II (Political Science) - Published by NCERT
4. Understanding Economic Development II - Published by NCERT