GEOGRAPHY (853)

Aims

1. To enable candidates to acquire knowledge (information) and to develop an understanding of facts, terms, symbols concepts, principles, generalizations, hypotheses, problems, trends, processes and methods of Geography at the national and global level.
2. To apply the knowledge of the principles of Physical Geography in explaining the causes and consequences of natural hazards and suggest ways of coping with them through sustainable development.
3. To develop skills of drawing maps, surveying, and drawing statistical diagrams and thematic maps.
4. To develop an interest in Geography.

CLASS XII

*There will be **two** papers in the subject:*

***Paper I** – Theory (3 hours) ...70 marks*

***Paper II** – Practical and Project Work …30 marks*

PAPER I: THEORY (70 Marks)

*There will be one Theory paper of **three** hours duration divided into **two** parts:*

***Part I (30 marks)** will be **compulsory** and will consist of Section A and Section B.*

***Section A** will include **compulsory** short answer questions testing knowledge, application and skills related to elementary/fundamental aspects of the entire syllabus.*

***Section B** will consist of one question on **map work**.*

***Part II (40 marks)** will consist of **seven** questions. Candidates will be required to answer **four** out of seven questions. Each question in this part shall carry **10 marks**.*

INDIA IN THE WORLD'S CONTEXT

1. Physical Environment

(i) **Locational setting - India:** size and area. Present importance of the location of India with reference to the Indian Ocean Rim countries and the Northern and Western frontiers. Comparison with China and Australia.

Extent, position with reference to latitude and longitude, length of coastline and frontiers with neighbouring countries. The locational advantages of India in the Indian Ocean and as a subcontinent.

(ii) **Structure of India** – Geological formation, relief and drainage; major physiographic divisions and their characteristics.

(a) Outline of the geological evolution and structure: basic definitions – geology, era, periods, physiography, geological structure, stratigraphy.

Names of the main Standard and Indian geological eras with reference to Indian Geology.

*Geological evolution of: the Peninsular Plateau, the Himalayas and the Great Plains. Difference between the Peninsular Plateau and the Himalayas. (The Geological rock formations of India are **not required**).*

(b) *The three-fold physiographic divisions: the Himalayan mountain complex, the Indus-Ganga-Brahmaputra Plains and the Peninsular Plateau.*

- ***Himalayan mountain complex: (orthoclinal structure)***

  The three parallel ranges, the northwest and northeast offshoots, comparison between Western and Eastern Himalayas.

  Regional divisions of the Himalayas (Kashmir/ Punjab Himalayas, Himachal/ Uttranchal/ Kumaon Himalayas, Nepal Himalayas, Assam Himalayas).

- ***Indus-Ganga-Brahmaputra Plains***

  The relief features – bhabar, tarai, bhangar, khaddar, bhur, barind, barkhans, doabs. Regional divisions of the plains: Rajasthan plain (the Great Indian desert), Punjab plain, Ganga plain, Brahamaputra/ Assam plain.).

- ***The Peninsular Plateau***

  The Malwa plateau, Chotanagpur Plateau and Deccan Plateau: the relief features - badland, Western Ghats, Eastern Ghats, Aravalis. Comparison between the Western Ghats and the Eastern Ghats.

The above three physical divisions are to be studied with reference to their extent, altitude, slope and landform characteristics.

- ***Coastal Plains***

  Comparison between Western and Eastern Coastal Plains and their divisions. The relief features: Lagoons, estuaries, deltas.

- ***Islands***

  Difference between Andaman and Nicobar and Lakshwadweep islands.

(c) *Drainage (i.e. rivers) and drainage systems: Names and sources of the main rivers and their major tributaries (Extent of river basin area* ***not required****).*

Comparison of Himalayan and Peninsular rivers.

(iii) **Climate: India** - Factors affecting India's climate: Temperature - factors affecting temperature. Atmospheric pressure conditions during the year; origin and mechanism of the monsoon, Jet streams, Southern Oscillations; wind and rainfall distribution during the year; characteristics of the four main seasons - hot and dry, hot and wet, cool and dry, cool and wet with reference to temperature distribution in north and south India, pressure, wind conditions – distribution of resultant rainfall; variability of rainfall, incidence of droughts and floods. Temperature and rainfall graphs of Mumbai, Delhi, Kolkata, Chennai, Jaisalmer, Leh, and Hyderabad.

Role of various factors affecting Indian climate – latitudinal extent, distance from the sea, northern mountain ranges, physiography, monsoon winds, upper air circulation, western disturbances and tropical cyclones, southern oscillation, El Nino; understanding of the concept and mechanism of monsoon; Indian Monsoonal Regime – onset, rain bearing system, break in the monsoon, retreat of the monsoon;

Seasons of India – with reference to temperature, pressure distribution, wind systems and local winds (loo, kalbaisaki/ Norwesters, Mango showers; explanation of the variability of rainfall in different areas over different seasons.

Droughts and Floods – meaning, causes, affected areas and mitigation programmes. Temperature and rainfall graphs of Mumbai, Delhi, Kolkata, Chennai, Leh, Jaisalmer and Hyderabad.

(iv) **Natural vegetation:** Major vegetation types of India, their geographical distribution with reference to rainfall and temperature conditions – description of the important tree types and their adaptation to the climate. Forest – area covered, importance, use, misuse and potential both for exploitation and conservation. Present forest policy.

Distinction between vegetation and forest, virgin vegetation; factors affecting vegetation.

Classification of vegetation types - tropical evergreen, monsoon forests, tropical dry forests, arid forests, deltaic forests, mountain forests and their geographical distribution and adaptation.

Importance of forest to man; Impact of human activity on vegetation. Forest area and forest cover in India. Forest Conservation – need, Social Forestry (Agro forestry, community forestry, commercial farm forestry, non-commercial farm forestry, urban forestry); Forest Conservation Movement: Van Mahotsav, Chipko Movement.

National Forest Policy (1988): objectives of the Forest Policy; Integrated Forest Protection Scheme.

2. Population and Human settlements

(i) Population of India compared to six countries - China, Australia, USA, Canada, Russia and Brazil.

Population of India as compared to the other six countries with reference to percentage ***of world population*** *and India's position in the world.*

(ii) National and State level patterns of population distribution.

Definition of census. Index of concentration (highest and lowest index of concentration as per the latest census), density of population – arithmetic and physiological.

Spatial distribution of population in India and explanation of the factors influencing it – landforms, climate, accessibility and level of development that result in this pattern. Comparison of the density at the State level and factors influencing it.

(iii) Pattern of population growth in the last three decades; implications for development.

Meaning of terminologies such as population, birth rate, death rate, population growth rate, natural growth rate and absolute growth of population, migratory growth, positive and negative growth.

Population growth of India at national level – trends of 1921, 1951 and 1981 to the latest Census, absolute growth rate of population. Demographic characteristics of India at the National level- birth rate, death rate, and natural growth rate from 1991 to the latest Census.

Drawing general conclusions about the:

Impact of rapid growth rate on economic development, on environment; need for planned development (to maintain the ecological balance).

(iv) Migration trends over the last 25 years.

Explanation of the important terms – migration, commutation, out migration, in migration, step-wise migration and migrant, push and pull factors.

Types (National and International migration, inter migration and intra migration, urban migration and rural migration) and trends of migration.

Streams of migration: (rural-rural, rural-urban, urban-urban and urban-rural).

Causes for migration - natural, economic, political and social.

Comparing the consequences of each type of migration on cities and rural areas.

(v) Demographic attributes at National level - trends and patterns of: 1. Rural urban population 2. Age and sex composition 3. Literacy levels 4. Working and non-working population; implications for development.

Study of the causes and trends of rural urban composition, age and sex ratio, literacy level, working and non-working population at the National level (highest and lowest figures for each of the above) in the latest census. Implications for development.

(vi) Rural settlements – size and number of villages as per the latest census. Types and patterns in hill areas, plains and coastal locations.

Distinction between Rural and Urban settlements; Rural and Urban Population. Classification of villages as per the latest census.

Factors affecting the types (distinction between compact and dispersed) and patterns (linear, circular, star shaped, rectangular, shapeless) of rural settlements in plains, coastal areas, mountains and plateau areas.

(vii) Urban settlements **–** size classification of towns as per the latest census. Study of population growth in Delhi, Mumbai, Kolkata and Chennai from1951 till the latest census.

Definition of an Urban area according to the latest census; Urban agglomeration, conurbation, urban sprawl, ribbon settlement, infill, metropolis, megalopolis.

*Trends of urbanization **only** in Delhi, Mumbai, Kolkata and Chennai from 1951 till the latest census.*

Factors that influence the growth of urban centres in India. Problems and advantages of urban growth.

3. Resources of India and their Utilisation

(i) Need for environmental management vis-à-vis development.

Understanding that from the development point of view, environment may mistakenly be seen as a 'resource' to be exploited, whereas, environment needs to be viewed as a 'capital' that needs to be managed carefully.

(ii) Land resources**:** Land use pattern in India – quality of cultivable land, size of land holdings.

Defining the term land resource; its importance and problems. Land use pattern – net sown area, area sown more than once, forests, land not available for cultivation, permanent pastures and other grazing lands, land under miscellaneous tree crops, culturable (cultivable) waste, fallow land, quality and size of cultivable land holdings. Methods to reduce fragmentation of land holdings.

(iii) Water resources and types of irrigation.

Water Resources: Their demand and utilization. Types of water resources: surface and ground water.

Meaning, importance and need for irrigation in India.

Sources of irrigation:

*Traditional Methods: wells, tanks, tube wells - Advantages and disadvantages; Study of **two** states where each of the above types of irrigation is mainly prevalent.*

*Modern methods: tube wells, multi-purpose projects, sprinkler irrigation, Perennial canals - Advantages and disadvantages. Names of **two** canals each in Uttar Pradesh, Punjab, Haryana, Andhra Pradesh, Tamil Nadu and Maharashtra.*

Use and misuse of water for irrigation; study of alternative methods of irrigation. Overwatering - reasons and regions affected by it; dangers of overwatering;

Conservation of water resources including their management; rain water harvesting.

(iv) Agriculture: Types, development and problems.

(a) Wet and dry farming, crop rotation and crop combination, intensity of cropping, problems of Indian agriculture; use of technology in agriculture. Modern inputs, change over from subsistence to commercial agriculture, need for Green Revolution**.** Diversifying Indian agriculture – importance of animal husbandry.

Wet and dry agriculture: Crop rotation and crop combination. Intensity of cropping – concept and crops associated; problems of Indian agriculture; Use of new technology – Green revolution: Need, impact and problems, second green revolution - strategies for second green revolution. Diversification of Indian agriculture – Animal Husbandry: meaning and its importance in Indian Agriculture.

(b) Study of crops:

(i) Conditions of growth (soil, temperature, rainfall requirements, crop seasons, secondary crops cultivated with them). (ii) World production and India's position. (iii) Major producing States in India and their rank as producers of the following crops:

Food grains - Rice (Japan), Wheat (China), Coarse grains – Sorghum (Jowar, Maize), Pennisetum (Bajra or Camboo), Eleusine (Ragi), Pulses.

Commercial and Industrial crops – Coffee (Nilgiris and N.E. India), Tea (Sri Lanka), Cotton (Pakistan), Sugarcane (China), Jute (Bangladesh), oilseed cultivation in India particularly of Groundnut, Coconut (Sri Lanka).

Conditions of growth: For each crop, the type of soil, temperature range, rainfall range, the crop seasons are to be done.

Main areas of growth of the above crops, in the countries specified, and reasons for growth are to be studied.

Name of the leading producer (country) in the world for each of the above crops (Food grains, commercial and industrial crops) and India's position in the world.

NOTE: Comparative study between countries with regard to food grains, commercial and industrial crops is not required.

Importance of Market Gardening and Orchard Farming – reasons and trends in development in recent years.

Self-explanatory

(v) Fishing in India, Japan and Bangladesh.

Methods, types of fish caught, fishing grounds; factors affecting the importance and development, fishing ports and markets, need and methods of fish conservation.

Understanding of marine and inland fisheries; deep sea and inshore fishing; pelagic and demersal fishing should be done. Problems affecting fishing in India, Japan and Bangladesh should be also taken up.

Two ports and two types of fishes of each coastal State in India should be studied.

(vi) Sources of Energy

(a) Minerals and power resources.

Distinguishing between metallic and non-metallic minerals; ferrous and non-ferrous minerals.

*Production and distribution (**three** leading States and **three** leading centres in each State) of Iron ore, mica, coal, manganese and petroleum; their uses.*

Iron ore, mica, coal: their types.

The main power resources - Nuclear thermal, hydel; three main States for generation of nuclear thermal and hydel power in India.

(b) Conventional energy sources - fossil fuels and firewood, potential (Indian context) and limitations of each source, methods of harnessing and environmental consequences of their use.

Conventional energy sources:

Firewood – for heating and cooking along with agricultural and animal waste.

Coal, Petroleum, diesel, LPG - their potential and limitations in India. Environmental concerns with regard to their use (global warming, thermal pollution in waters, fly ash, atmospheric pollution, etc.).

(c) Non-conventional energy sources - types of non-conventional sources (bio-mass, solar, wind, ocean, hydel, geothermal, nuclear), potential (Indian context) and limitations of each source; their environmental consequences; need to promote non-conventional energy sources.

Advantages and limitations of each non-conventional energy source.

Uses of these energy sources and distribution.

Understanding the need to promote non-conventional energy sources.

(The study should include uses and the distribution of the above energy resources).

4. Infrastructural Resources (Development of Transport and Communication).

(a) Railways, Roadways, Water transport (inland and coastal), Air transport, Pipelines - these modes of transport are to be studied with regard to –

Location and state wise distribution of air, road and rail routes; location of waterways and pipelines; natural and economic factors that govern their distribution; density and growth. Patterns in India.

The present position, areas well and poorly served by each mode.

Problems – comparative advantage of each mode of transport, national goals to be achieved in the development of modes of transport (The Golden quadrilateral - its north-south and east-west corridor).

(i) Ports, their location and advantage; major exports and imports of different ports. Nature and direction of trade from the ports. International trading patterns and products in the last five years.

Distinguishing between harbour and port; natural and artificial harbours. Location of major ports in India and their advantage; main items of export and import from different ports and the patterns in the last five years.

(b) Communication – importance of communication in rural development and its policy. Importance of infrastructure as key to the development of an industrial economy.

Modern means of communication - satellites and remote sensing - Geographic Information Systems (GIS), cellular phones, radio, doordarshan, internet; difference between mass communication and tele communication. Prasar Bharti. Infrastructure as key to the development of an industrial economy.

5. Industries

(a) Study of the location and distribution of important industrial centres; a general comparison of disparities.

Self-explanatory.

(b) Major and minor industrial regions – factors governing their growth.

Reasons for the spread of industrial areas; Understand how the distribution of heavy and consumer industries varies in the different regions; Understanding why certain industries are more in a particular region.

Major Industrial regions: Mumbai-Pune, Hooghly, Bengaluru-Tamil Nadu, Gujarat, Chota Nagpur, Vishakhapatnam-Guntur, Gurgaon-Delhi-Meerut.

Minor Industrial regions: Ambala-Amritsar, Saharanpur-Muzaffarnagar, Northern Malabar.

Factors governing the growth of the above to be studied.

(c) Location, production and growth of the following industries:

(i) **Agro based industries** – Sugar, cotton textile and ready-made garments.

Sugar Industry:

Maharashtra (Ahmednagar and Pune), Uttar Pradesh (Muzaffarnagar and Saharanpur), Tamil Nadu (Coimbatore and North Arcot).

Cotton Textiles:

Maharashtra (Mumbai and Pune), Gujarat (Ahmedabad and Surat), West Bengal (Kolkata and Howrah), Tamil Nadu (Madurai and Chennai).

Ready-made garments:

Delhi, Bengaluru, Mumbai, Kolkata

(ii) **Mineral based industries** – Iron and steel, aluminium, cement, and transport equipment. Petrochemicals, including refineries and fertilizers.

The following industrial centres of each industry are to be studied.

Iron and Steel:

TISCO (Jamshedpur), Vishweshvarya Iron and Steel Plant (Bhadravati), Bhilai Iron and Steel Plant (Bhilai), Rourkela Iron and Steel Plant (Rourkela), Hindustan Steel Limited Plant (Durgapur), Bokaro Iron and Steel Plant (Bokaro), Salem Iron and Steel Plant (Salem), Vishakhapatnam Iron and Steel Plant (Vishakhapatnam), POSCO(Paradwip).

(Integrated and mini steel plants: meaning, advantages and disadvantages also to be studied.)

Aluminium:

INDAL (Hirakud), HINDALCO (Renukoot).

Cement:

Katni Cement and Industrial Company Limited (Katni), Andhra Pradesh (Krishna, Vijaywada), Rajasthan (Savai Madhavpur, Udaipur).

Transport equipment:

Chittaranjan Locomotive Works (Chittaranjan), Diesel Locomotive Works (Varanasi), TELCO (Jamshedpur), BHEL (Bhopal).

Automobile Industry:

Maruti Udyog (Gurgaon), Premier Automobiles (Mumbai).

Ship Building Industry:

Hindustan Shipyard Limited (Vishakhapatnam), Cochin Shipyard Limited (Kochi), Mazgon Dock (Mumbai) Garden Reach Workshop(Kolkata).

Aircraft Industry:

HAL-Hindustan Aeronautics limited (Nasik, Koraput, Bengaluru).

Petro Chemicals:

UDEX (Koyali), IPCL (Vadodara).

Oil refineries:

IOCL (Barauni, Haldia and Digboi), HPCL (Mumbai and Vishakhapatnam).

Fertilizers:

FCI (Sindri), HFCL (Barauni), IFFCO (Kandla).

NOTE: Factors responsible for the location, development and present status of the Agro and Mineral based industries mentioned above, as well as the distribution centres are to be studied.

Difference between key and footloose industry; industrial clusters and indices to identify industrial clusters; industrial inertia.

Maps and sketches of Industrial regions and centres (location of agro based and mineral based industries) should be the basis for explaining the pattern of industrial development.

(d) Tourism industry – Major natural and cultural tourist areas in India. Their special features and level of development - impact on environment and local economy. Tourist flows.

Definition of tourism, growth of tourism, advantages of tourism, important places – both natural and cultural. Positive and negative impact of tourism, problems of tourism and measures for developing eco-tourism.

6. Regional Economic Development

(Case studies)

Case studies will be preceded by a brief understanding of the meaning of development, multilevel planning and planning regions. These case studies will be undertaken with reference to the advantages and disadvantages that have accrued to the people and area - aspects covered will be their geographical location, resource base, developmental history, present trends of population, occupations, agriculture and industrial activities, issues of development.

1. Area development in Chattisgarh region – mining, silk industry and farming.
2. Electronics industry in Bengaluru– reasons for its development, extent, national and international linkages and problems.
3. Growth of Haldia port, its industries and hinterland.

7. Map Work

A question on map work will be set to identify, label and locate any of the following items studied in topics 1-6:

MAP LIST:

Locational setting of India:

$8^0$4'N-$37^0$6'N, $68^0$7'E- $97^0$25'E (Latitudinal and longitudinal extent of India); 23.5 ^{0} N (Central latitude) and 82.5 ^{0} E (Central longitude); Indira Col and Cape Comorin (Northern and Southern point of mainland India).

Mountains:

3 parallel ranges of Himalayas, Trans Himalayan range – Karakoram, Pir Panjal, Ladakh, Zaskar. Aravallis, Vindhyas, Satpura, Western and Eastern Ghats, Nilgiris, Cardamom hills, Garo, Khasi, Jaintia hills, Patkoi hills, Naga hills, Mizo hills.

Peaks:

Mount Everest, Godwin Austin, Kanchenjunga, Gurushikhar, Dodabetta, Anaimudi, Mahendragiri,

Plains:

Indus-Ganga-Brahmapurtra region, Konkan, Kanara, Malabar, Coromandel, Northern Circars.

Plateaus:

Malwa, Chota Nagpur, Deccan, Meghalaya.

Peninsula:

Kathiawar, Kachchh.

Lakes:

Chilika, Pulicat.

Waterbodies:

Arabian Sea, Bay of Bengal, Palk Strait, Gulf of Kachchh, Gulf of Khambat,

Passes:

Karakoram, Shipki La, Nathu La, Bomdi La, Palghat, Bhorghat, Thalghat.

Rivers:

Indus, Jhelum, Chenab, Ravi, Beas, Sutlej, Ganga, Yamuna, Gomti, Ghaghara, Gandak, Kosi, Chambal, Betwa, Ken, Son, Damodar, Luni, Narmada, Tapi, Mahanadi, Godavari, Krishna, Kaveri, Brahmaputra.

Climate of India:

Movement of Southwest and North east monsoon winds from season to season, area of low and high pressure varying from season to season, direction of westerly and easterly jet streams, average annual rainfall distribution in India, Main drought prone and flood prone areas.

Natural Vegetation:

Main area of: Tropical Evergreen, Tropical Deciduous, Tropical dry, Deltaic and Arid forests.

Population:

The States of India (according to the latest Census) for the following: The Lowest density of population, highest density of population, highest level of urbanization, lowest level of urbanisation, highest Index of Concentration of population, the highest sex ratio, the lowest sex ratio, the highest literacy, the lowest literacy;

Urban cities of Delhi, Mumbai, Chennai and Kolkata, Bengaluru, Hyderabad, Ahmedabad, Jaipur, Lucknow, Patna, (metropolitan and capital cities).

Resources of India:

Main region of intense cropping in India; Main State/regions of India for: wells, tanks, tube wells, perennial canals.

Agriculture:

Main producing States/regions of India for: Rice, Wheat, Maize, Jowar, Bajra, Ragi, Pulses, Coffee, Tea, Cotton, Jute, Sugarcane, Groundnut, Coconut.

Minerals:

Iron Ore (Keonjhar, Bellary, Raigarh, Singhbhum), Coal (Jharia, Bokaro, Raniganj), Petroleum (Digboi, Mumbai High, Ankleshwar, Bassein), Manganese (Sundergarh, Nagpur) Mica (Nellore, Bhilwara).

Power resources:

Nuclear Power (Kaiga, Kalpakkam, Tarapur, Rawatbhata, Narora, Kakrapara), Thermal Power (Bongaigaon, Santaldih, Panipat, Ahmedabad, Chandrapur, Nevyelli, Trombay, Vijaywada); Hydroelectric power stations (Bhakra Nangal, Hirakud, Damodar, Nagarjunasagar, Tungabhadra, Rihand).

Industries:

Sugar Industry: Ahmednagar, Pune and Coimbatore;

Cotton Textiles: Mumbai, Ahmedabad Surat and Madurai.

Iron and Steel: TISCO(Jamshedpur), Bhilai Iron and Steel Plant (Bhilai), Vishakhapatnam Iron and Steel Plant (Vishakhapatnam);

Aluminium: INDAL (Hirakud), HINDALCO (Renukoot);

Cement: (Katni) and (Udaipur);

Transport equipment: Chittaranjan Locomotive Works (Kolkata) and DLW (Diesel Locomotive Works - Varanasi).

Automobile Industry: Maruti Udyog (Gurgaon), Premier Automobiles (Mumbai).

Ship Building Industry: Hindustan Shipyard Limited (Vishakhapatnam), Cochin Shipyard Limited (Kochi), Mazgon Dock (Mumbai); Garden Reach Workshop(Kolkata).

Aircraft Industry: HAL - Hindustan Aeronautics Limited (Nasik, Bengaluru, Kanpur);

Petro Chemicals: UDEX (Koyali) and IPCL (Vadodara);

Oil refineries: IOCL (Digboi, Barauni and Haldia);

Fertilizers: FCI (Sindri), IFFCO (Kandla).

Transport:

Trace the route of: National Highway 1, National Highway 2, National Highway 6, National highway 7, Golden Quadrilateral - 4 sides, North south Corridor, East West Corridor; State with the Highest Density of roads.

Ports:

Kandla, Mumbai, Marmagao, New Mangalore, Kochi, Tuticorin, Haldia, Chennai, Vishakhapatnam, Kolkata.

Hinterland:

Kolkata, Haldia.

Case studies:

Tracing of the Chattisgarh region, city of Bengaluru and its connectivity (road and rail ways) with the adjacent megacities & ports and hinterland of Haldia.

SKETCH MAPS

Candidates should be able to draw, label, understand and interpret the sketch maps related to the following topics:

- *Locational setting of India;*
- *Relief and drainage of India;*
- *Climate;*
- *Population;*
- *Industries.*

PAPER II: PRACTICAL WORK AND PROJECT WORK (30 Marks)

Candidates will be required to undertake the following Practical work and Project work .

1. Practical Work:

Any **four** of the following topics to be undertaken:

(i) Drawing of scales: linear, graphic scales showing primary and secondary divisions; representative fractions and statement of scale methods.

(ii) Drawing of cross-section or profiles of important contours, viz. ridge, plateau, escarpment, valley, conical hill, types of slope, sea cliffs, waterfalls, spurs, by using vertical exaggeration and horizontal equivalent.

(iii) Understanding and illustrating location references of SOI maps.

(iv) Map reading and interpretation of survey of India maps: Study will be based on representative portions of any **two** topographical sheets. It will include the description of location, extent, relief features, drainage, land use, settlement patterns, communications and inferences about human occupations and stage of economic development of the area.

(v) Introduction to Geographic Information System: Elements of visual interpretation of remote sensing maps/ images.

Colour significance in the image and true colour (false colour composition): texture; size; shape; shadow; association.

(Reference material – Wikipedia, Google. earth, IIRS Hyderabad).

(vi) Elementary principles of surveying an area: preparing two plans of school compound and/or a small area using Plane table/ GPS.

2. Project Work (Assignment):

Local field surveys on any **one** of the following will be submitted as Project Report. The length of project report will be 15-20 written pages, excluding photographs, maps, diagrams and sketches. No extra credit will be given for computer based maps or text. These surveys should be organized with a table of contents, sample taken and statistical methods used, interview schedule. The report should be organized systematically, and the conclusions should be clearly stated.

(i) Agricultural land use survey.

Choose a district or topographical map of an area 1: 250000 and make a sketch map showing

land use; compare the patterns of these. Alternatively, a local village could be chosen and the fields mapped from the cadastral map with information on the crops grown in different seasons and the location of the village, its roads and landmarks, if any.

(ii) Household survey of about 30-60 households of a village or locality.

Family size, age structure, educational background, occupation, involvement of men and women in economic activity, educational service. Draw conclusions to reflect the economic development of the households.

(iii) Amenity study.

Study of hospitals in a city, schools (school where you studied), post offices, municipal zones within the city (blocks in a village study) – reasons for travel (based on the importance and demand for the place), travel time, travel distance, mapping the hinterland of the service.

(iv) Study of a manufacturing industry or a self-employed person.

Visit a manufacturing unit or self-employed person – cycle or car repair shop, small fabricating unit, factory if nearby and find out – source of raw material, supply routes, final product, areas where it is sent, manpower strength and their organization.

(v) Area development of a multipurpose river valley project – impact on the region.

Self-explanatory.

The Practical Work and the Project Work will be assessed by the teacher and a Visiting Examiner appointed locally and approved by the Council. No question paper for practical work and project work will be set by the Council.

Evaluation of Practical Work and Project Work will be as follows:

Practical file (Sessional Record):	10 marks
Assignment (Project Report):	10 marks
Viva voce:	10 marks