



ગુજરાત જાહેર સેવા આયોગ

સેક્ટર - ૧૦-એ, ૯-૩ સર્કલ પાસે, ૯ રોડ,
ગાંધીનગર - ૩૮૨૦૧૦

જાહેરાત ક્રમાંક:૨૦/૨૦૨૪-૨૫, ટેકનિકલ એડવાઇઝર, વર્ગ-૧ની જગ્યા પર ભરતી માટેની
પ્રાથમિક કસોટીમાં ભાગ-૧ અને ભાગ-૨ ના ૧૮૦ મિનિટના સંયુક્ત પ્રશ્નપત્રનો અભ્યાસક્રમ

સીધી પસંદગીથી ભરતીની પ્રાથમિક કસોટીનો અભ્યાસક્રમ		
ભાગ-૧		
માધ્યમ: ગુજરાતી અને અંગ્રેજી.		કુલ ગુણ : ૧૦૦
મુદ્દા	વિષય	ગુણ
૧	ભારતની ભૂગોળ- ભૌગોલિક, આર્થિક, સામાજિક, કુદરતી સંસાધન અને વસ્તી અંગેની બાબતો- ગુજરાતના ખાસ સંદર્ભ સાથે	૩૦
૨	ભારતનો સાંસ્કૃતિક વારસો- સાહિત્ય, કલા, ધર્મ અને રચાપત્યો- ગુજરાતના ખાસ સંદર્ભ સાથે	
૩	ભારતનો ઇતિહાસ- ગુજરાતના ખાસ સંદર્ભ સાથે	
૪	ભારતની અર્થવ્યવસ્થા અને આયોજન	
૫	ભારતીય રાજનીતિ અને ભારતનું બંધારણ: (૧) આમુખ (૨) મૂળભૂત અધિકારો અને હુકમો (૩) રાજ્યનીતિના માર્ગદર્શક સિદ્ધાંતો (૪) સંસદની રચના (૫) રાષ્ટ્રપતિની સત્તા (૬) રાજ્યપાલની સત્તા (૭) ન્યાયતંત્ર (૮) અનુસૂચિત જાતિ, અનુસૂચિત જનજાતિ અને સમાજના પછાત વર્ગો માટેની જોગવાઈઓ (૯) નીતિ આયોગ (૧૦) બંધારણીય તથા વૈધાનિક સંસ્થાઓ- ભારતનું ચૂંટણી પંચ, કોમ્પ્યુટર એન્ડ ઓડિટર જનરલ, માહિતી આયોગ	
૬	સામાન્ય વિજ્ઞાન, પર્યાવરણ અને ઇન્ફર્મેશન એન્ડ કોમ્યુનિકેશન ટેકનોલોજી	૧૦
૭	ખેલ જગત સહિત રોજબરોજના પ્રાદેશિક, રાષ્ટ્રીય અને આંતરરાષ્ટ્રીય મહત્વના બનાવો	૧૦
૮	સામાન્ય બૌદ્ધિક ક્ષમતા કસોટી (૧) તાર્કિક અને વિશ્લેષણાત્મક ક્ષમતા (૨) સંખ્યાઓની શ્રેણી સંકેત અને તેનો ઉકેલ.	૩૦

	<p>(૩) સંબંધ વિષયક પ્રશ્નો.</p> <p>(૪) આકૃતિઓ અને તેના પેટા વિભાગ, વેન આકૃતિઓ</p> <p>(૫) ઘડીયાળ, કેલેન્ડર અને ઉમર સંબંધિત પ્રશ્નો.</p> <p>(૬) સંખ્યા વ્યવસ્થા અને તેના માનક્રમ.</p> <p>(૭) શૈક્ષિક સમીકરણ (એક કે બે ચલમાં)</p> <p>(૮) પ્રમાણ, હિસ્સો અને ચલ.</p> <p>(૯) સરેરાશ યા મધ્યક, મધ્યસ્થ અને બહુલક, ભારિત સરેરાશ. .</p> <p>(૧૦) ઘાત અને ઘાતાંક, વર્ગ, વર્ગમૂળ, ઘનમૂળ, ગુ.સા.અ. અને લ.સા.અ</p> <p>(૧૧) ટકા, સાદુ અને ચક્રવૃદ્ધિ વ્યાજ, નફો અને નુકશાન.</p> <p>(૧૨) સમય અને કાર્ય, સમય અને અંતર, ઝડપ અને અંતર.</p> <p>(૧૩) સરળ ભૌતિક આકૃતિઓના ક્ષેત્રફળ અને પરિમિતિ, જથ્થો અને સપાટીનો વિસ્તાર (છ સમાંતર બાજુ ધરાવતો ઘન, ઘન, સિલિન્ડર, શંકુ આકાર, ગોળાકાર).</p> <p>(૧૪) રેખા, ખૂણા અને સામાન્ય ભૌમિતિક આકૃતિઓ-સાદી કે ત્રાંસી સમાંતર રેખાઓના ગુણધર્મો, ત્રિકોણની સાપેક્ષ બાજુઓના માપનના ગુણધર્મો, પાયથાગોરસનો પ્રમેય, ચતુર્ભૂજ, લંબગોળ, સમાંતર બાજુ ચતુષ્કોણ, સમભૂજ ચતુષ્કોણ.</p> <p>(૧૫) બીજગણિતનો પરિચય-BODMAS-કાનાભાગુવઓ-વિચિત્ર પ્રતિકોની સરળ સમજૂતિ.</p> <p>(૧૬) માહિતીનું અર્થઘટન, માહિતીનું વિશ્લેષણ, માહિતીની પર્યાપ્તતા, સંભાવના</p>	
૯	<p>ગુજરાતી વ્યાકરણ</p> <p>(૧) બેડણી</p> <p>(૨) સમાનાર્થી-વિરુદ્ધાર્થી શબ્દો</p> <p>(૩) રૂઢિપ્રયોગો અને કહેવતો</p> <p>(૪) સમાસ</p> <p>(૫) સંધિ</p> <p>(૬) અલંકાર</p> <p>(૭) છંદ</p>	૧૦
૧૦	<p>English Grammar</p> <p>(1) Articles, Pronouns, Adjectives, Prepositions, Conjunctions and Question tag.</p> <p>(2) Verb and Tense, Agreement between subject and verb, Gerund, Participles.</p> <p>(3) Modal auxiliaries. Usage of can, may, could, should, etc.</p> <p>(4) Use of some, many, any, few, a little. Since and for.</p> <p>(5) Active and passive voice</p> <p>(6) Degrees of adjectives.</p> <p>(7) Common errors of usage.</p>	૧૦

❖ મુદ્દા ક્રમાંક ૮ થી ૧૦ માટેનો અભ્યાસક્રમ ધોરણ- ૧૨ સમકક્ષ રહેશે.

**Syllabus for preliminary test for recruitment from Direct Selection
Part-1**

Medium: Gujarati and English

Total Marks: 100

Point No	Subject	Marks
1	Geography of India – Geographical, Economic, Social, Natural Resources and Population related topics – With Special reference to Gujarat	30
2	Cultural Heritage of India – Literature, Arts, Religion and Architecture - With Special reference to Gujarat	
3	History of India- With Special reference to Gujarat	
4	Indian Economy and Planning	
5	Indian Politics and Constitution of India: (1) Preamble (2) Fundamental Rights and Fundamental Duties (3) Directive Principles of State Policy (4) Composition of Parliament (5) Powers of the President of India (6) Powers of Governor (7) Judiciary (8) Provisions for Scheduled Casts, Scheduled Tribes and Backward Classes of the society (9) NITI Aayog (10) Constitutional and Statutory Bodies: Election Commission of India, Comptroller and Auditor General, Information Commission	
6	General Science, Environment and Information & Communication Technology	10
7	Daily events of Regional, National and International Importance including Sports	10
8	General Mental Ability Test (1) Logical Reasoning and Analytical Ability (2) Number Series, Coding-Decoding (3) Questions about relationship. (4) Shapes and their Sub-sections, Venn Diagram (5) Questions based on Clock, Calendar and Age (6) Number system and order of Magnitude (7) Linear Equations - in one or two Variables (8) Ratio, Proportion and Variation (9) Average of Mean, Median, Mode- including weighted Mean (10) Power and Exponent, Square, Square Root, Cube Root, H.C.F. & L.C.M. (11) Percentage, Simple and Compound Interest, Profit and Loss (12) Time and Work, Time and Distance, Speed and Distance (13) Area and Perimeter of Simple Geometrical Shapes, Volume and Surface Area of Sphere, Cone, Cylinder, Cubes and Cuboids (14) Lines, Angles and Common geometrical figures - properties of transverse or parallel lines, properties related to measure sides of a triangle, Pythagoras theorem, quadrilateral, rectangle, Parallelogram and rhombus. (15) Introduction to algebra-BODMAS, simplification of weird Symbols. (16) Data interpretation, Data Analysis, Data sufficiency, Probability	30

9	<p>Gujarati Grammar</p> <p>(૧) બેડણી</p> <p>(૨) સમાનાર્થી-વિરુદ્ધાર્થી શબ્દો</p> <p>(૩) રૂઢિપ્રયોગો અને કહેવતો</p> <p>(૪) સમાસ</p> <p>(૫) સંધિ</p> <p>(૬) અલંકાર</p> <p>(૭) ઇંદ</p>	10
10	<p>English Grammar</p> <p>(1) Articles, Pronouns, Adjectives, Prepositions, Conjunctions and Question tag.</p> <p>(2) Verb and Tense, Agreement between subject and verb, Gerund, Participles.</p> <p>(3) Modal auxiliaries. Usage of can, may, could, should, etc.</p> <p>(4) Use of some, many, any, few, a little. Since and for.</p> <p>(5) Active and passive voice</p> <p>(6) Degrees of adjectives.</p> <p>(7) Common errors of usage.</p>	10

❖ The standard of the syllabus for point no. 8 to 10 will be equivalent to Standard 12.

Syllabus of Preliminary Examination for the post of Technical

Advisor, Class-I

Marks-200

Questions-200

Medium-English

1. CLIMATE CHANGE: INTRODUCTION & HISTORY

Climate Change: A Brief Introduction. History Prior to the 20th century and 20th Century Onwards. Climate change in Early 1900s to 1950s. Increasing concern, 1950s–1960s. Scientists increasingly predict warming, 1970s. Consensus begins to form, 1980–1988. Discredited theories and reconciled apparent discrepancies. Past estimates of greenhouse gas emissions and temperature rises. Paleoclimates and sunspots, Introduction to Paleoclimatology. Major events : Oceanic Anoxic Events, Holocene climatic optimum. Paleocene–Eocene Thermal Maximum, Younger Dryas/The Big Freeze. Little ice age and Faint young Sun.

2. UNIVERSE: AN OVERVIEW

Introduction of Universe. Age of Universe. Galaxies & Stars. The Solar Systems: Planets. Space and Satellites. Earth: History, Orbital, Physical characteristics. Earth Correlation with Sun and Moon System. International Space Station. Mountains, Desserts, Grasslands, Oceans/Seas, Rivers, Agri- fields, Forests. Polar regions, longitudes, latitudes, Altitudes, Above sea levels.

3. ATMOSPHERE

Formation, composition of Earth's atmosphere, mass and layering of atmosphere, Electromagnetic, Solar and Terrestrial radiation, variation with latitudes and seasons. Adiabatic temperature changes, air stability and instability. Ozone layer. Principle and use of tools to study atmosphere. Temperature measurements and controls. Dry and Wet adiabatic lapse rate, inversion of temperature. Atmospheric pressure and winds, Wind observations, Factors affecting wind Gradient and Geostrophic winds, local winds and Jet streams. Measures of atmospheric composition: Mixing ration, number density and partial Pressure, Atmospheric transport: Geostrophic flow, General circulation, Vertical transport, turbulence. Atmospheric lifetime and time-scales: Definition, Box models, Source and Sinks mechanism.

4. HYDROSPHERE

Principle and use of tools to study hydrosphere. Natural and man-made water bodies-types. Significance and constraints, humidity, condensation, Physics of the Water vapor and cloud feedbacks: cloud processes-formation, precipitation and fog, Acid rain, evaporation and transpiration, infiltration. Soil water storage, surface runoff and hydrologic cycle, Surface and subsurface ocean currents, ocean tides and currents, Pressure measurements and distribution. Principles and Methods to study physicochemical properties of water. Impacts on Water Cycle and Water Demand, Water Supply and Water Quality. Impacts of Changes in Water Resources on Other Sectors. Climate Ready Estuaries, Climate Ready Water Utilities, Green Infrastructure, Healthy Watersheds. Sustainable Infrastructure in Water sense. Coastal zone management, Ocean development, Mangrove ecosystem.

5. LITHOSPHERE, PEDOSPHERE & CRYOSPHERE

Structure of Earth, Geological Timescales, Big bang theory. Continental Drift theory and plate tectonics, Earthquake and volcanic activity Theories, occurrences, physical processes and types. Types and composition of rocks and soils, Role of climate in soil formation. Soil classification, Erosion, Deposition and Conservation. Physical and chemical properties of soil, degradation and reclamation. Physical

Geography and climate processes of Earth. Land surface processes and feedbacks: land surface change and surface atmosphere exchange. Cryosphere processes and feedbacks: Snow cover and permafrost, sea & Land ice. Nutrients in ecosystem, food chain and food web. Carbon cycle, nitrogen cycle, sulfur cycle and other mineralization processes. Principles and Methods to study physicochemical properties of soil.

6. CLIMATE CHANGE AND BIODIVERSITY

Biosphere; Biological classification of organisms. Genetics, Species diversity and Ecosystem biodiversity. Principles of Conservation Biology including Planning, Legislation and Implementation of Conservation programmes, Flora-fauna status, in-situ and ex-situ conservation. Biomes- terrestrial and aquatic, classification, maps, anthropogenic biomes. Documentation of biodiversity and methods to study ecosystems. Techniques to enumerate RET (Rare, Endangered and Threatened) species. Climate change impacts on forests and transportation, Forest dispersion and shifting, Forest fires, Sustainable forest management: Present area, Reduction, Strategies, Adaptation. Ecophysiological Responses, Tree Responses to Temperature and Water Availability. Tree Responses to Increased CO₂ Concentration, Carbon Storage and Nutrient Availability, Forest biomass for fuel production. Biodiversity and related Adaptation mechanisms and strategies.

7. CLIMATE CHANGE IMPACTS ON ENERGY & SOCIOECONOMIC ISSUE

Renewable sources, production mechanisms, project planning for solar PV. Wind generation farms-potentials, management and risks under warmer climate. Energy supply: History of energy, Role of energy in development of human civilization, Energy Production. Emissions from energy generation. Role of energy in current climate change. Climate and Energy Systems and its relevance to various stakeholders in the energy sector. The effects of climate change on power & heat plants – assessing the risks and opportunities. Renewable and alternative energy technologies options: Biomass, Solar, Hydro, Geothermal and Wind. Technology transfer, Current Transfer of Climate Change Mitigation Technology, Methodological and Technological Issues, Barriers to Technology Transfer. Transfer of technologies between countries, Programmes and Policies. Energy balance of the earth, Human induced climate variations.

8. HUMAN GEOGRAPHY AND CULTURE VIEWPOINT

Human ecology of climate change. Anthropogenic activities responsible for climate change: Source activities (Burning of fossil fuel, Industrial activity, Urbanization, Agriculture, transportation, waste generation). Removals of Sinks and Land Use, Land Use Change and Forestry. Population and its environmental impact: Population, Population growth, Variation among nations, Population explosion, Family welfare programs. Climate change impacts on Environment and human health risk. Climate change and food security: Food systems(Agriculture, Animal husbandry, Fisheries), impacts of Climate Change on Food systems, Population and food security. Climate change impacts on agriculture, Impacts on Crops, crop cycles, soil quality and soil organic carbon. Impacts on Livestock, fodder production and availability, livestock crisis Management. Impacts on Fisheries, fishing cycles and impact on local community due to change in fishing cycles. Financial mechanisms for crop/livestock/fisheries loss insurances, state government policies and aids, central government policies and aids.

9. GREENHOUSE GASES

Greenhouse gases and its sources. Enhanced greenhouse gas effect : Pollution(Air, Water, Soil). Global warming and Greenhouse gases policy issue. Effects and causes of global warming, Measurement and procedures to assess global warming, Indian industry and global warming, Role of Indian industry in production of CFC products. Sources of Aerosols, Direct and indirect effects, Production mechanisms of aerosols, Trends in aerosols. Radiative forcing and GHGs-Definition, concept and processes, Forcing – response relationship, Radiative forcing by tropospheric ozone. Role of plants and Innovative approaches, GHG reduction initiatives. Biological modulation, GHG. aerosols, Anaesthetic gases-desflurane,

isoflurane and sevoflurane. Portfolio manager, CRIS, NOAA, Photoacoustic spectroscopy ,mass spectrometer, AGAGE,ADS GC-MS, MEDUSA GC-MS.

10. WEATHER AND CLIMATE

Definition of weather and climate, Meteorology and Climatology, elements. Types of classification systems-empirical, applied and genetic systems. Koeppen classification system,: three basic climate groups: low latitude, mid-latitude, high latitude. Aridity index, drought, Holdridge life zones system :Global bioclimatic scheme for the classification of land areas. Weather and climate change, Geological time scale, ice ages, record of past 1000 years, human influences. Internal forcing mechanisms and external forcing mechanisms, The Milankovitch Cycle theory, Solar variation. Evidences of warming and change in atmosphere/ ocean circulations. Climate extremes, Cyclones, thunderstorms, Tornadoes, Heat waves. Lifetime of Kyoto gases and sink mechanisms, Observations. Trends and Budget: Non CO₂ Kyoto gases, Montreal protocol gases.

11. NATURAL / ARTIFICIAL MANMADE HAZARDOUS / CALAMITIES:

Formation, structure, types and impacts of Cyclone , Thunderstorms, winterstorms, summer storms, Tornadoes and Hurricanes. Formation, structure, types and impacts of Floods, droughts, precipitation, El nino and arctic circulation. Formation, structure, types and impacts Heatwaves, Wild fires, Health effects, Heinrich events and Daansgard-Oeschger (D-O) events. Sea level rising, temperature rising, Floods and droughts. Polar ice, Isotopes, Ice melting and Ice core analysis, glaciers and arctic sea loss. Sea level changes and Shore line changes (Strand lines) and Temperature changes. Climate indices and extreme events. Measurement of various climate indices, aridity index. Seismic activity, Remote sensing data for temperature and precipitation.Paradox.

12. CLIMATE CHANGE MITIGATION

Mitigation strategies and options for various sectors. Basic concepts, methodology and Structure of mitigation assessment. Improved energy efficiency, fuel substitution, hydropower, carbon capture and sequestration, land based carbon sinks. General and technology specific barriers and The rebound effect, Equity and sustainability issues, issues of biodiversity. Assessment of mitigation costs and benefits. Sector-wise measures and instruments to mitigate climate change : Short term and Long term Mitigation action. New and clean technologies. Emission standards : Vehicle emission performance standard : CARB, EURO and Bharat Stage. Sustainable development and climate change mitigation. Initiative and mitigation of coastal hazards, Analysis and decision support tools in mitigation of Climate change.

13.CARBON MARKET

Carbon Markets: Emission trading, Carbon accounting, Carbon Offsets, Tradable Permits and Leakage. Structure of international carbon market, allowance and project based markets: Chicago Climate. Exchange, European Climate Exchange, European Energy Exchange, NASDAQ OMX Commodities, Europe, Power Next, Commodity Exchange Bratislava. Pricing structures and Formulation: Fixed, Floating, Combination of the two, Buyers and sellers of Carbon assets. Global Carbon Budget. Transactions and trends and Voluntary carbon market.Tree ring analysis, Palynology and Sclerochronology : Principles, Applications and Drawbacks.Decision making processes: Three methods (eco-efficiency, environmental priority strategy (EPS) system, Certified emission reduction (CER) price), Considering cost and CO₂ emission.

14.CLIMATE CHANGE ADAPTATION

Definition and issues: Definition, Types of adaptation (Anticipator, reactive, human, natural), Systems, Scales, and Actors. Methods of adaptation. Vulnerability and resilience: Concept, definition, methodology and case studies. Sector –wise adaptation strategy (agriculture, forests, water resources,

coastal resources, fisheries, human health), adaptation potential and challenges. Framework for estimating benefits and cost to adaptation. Linking variability to climate changes : Case examples. Economic and policy instruments to promote adaptation. Introduction to Adaptive Capacity: Definition, concept and issues, Determinants of adaptive capacity: Economic resources, Technology, Information and skills, Infrastructure, Equity and Institution. Methods of enhancing adaptive capacity in sectors: Agriculture, Forestry Social, Rural, Urban, Coastal. Tools to address climate risks in development activities, Disaster risk reduction policy and plans. Tools and approaches to incorporate vulnerability and adaptation in development projects, NAPAs, CBA, ALM, APF,SEA,CC-DARE.

15. TOOLS AND TECHNIQUES FOR IMPACTS ASSESSMENT

Methods of impacts and vulnerability assessment: Approaches: sensitivity, adaptability and vulnerability. Key determinants of impacts: magnitude of change, rate of change, transient scenarios, climate variability and extreme events, thresholds. Effect of complexities of analysis: climate uncertainties, socio-economic Uncertainties. low-probability catastrophic events, risk and uncertainties, Valuation methods- monetary measures, discounting, validation. Anticipating effects of climate change: scale of analysis for impact assessment, the Baseline for Comparison. Integrated Scenarios of Climatic and Socioeconomic Change. What are the Prospects for assessing the impacts of Climatic Extremes and variability. Statistical Tools and Techniques for Impact Prediction, Artificial experiments, Sensitivity analysis, Analogues, storylines, scenarios. Social science research methodologies. Land use and cover management, Change, Degradation, Socio- ecological system Impacts.

16. POLITICAL ECONOMY AND CLIMATE CHANGE

Policy and Legislation: National and International Scenarios. UNFCCC and Montreal Protocol (Multilateral Environmental Agreements –MEA). Scientific and implementation bodies, actors in negotiation process. Decisions of COP and MOP, Subsidiary bodies of CDM (Designated National Authority), CDM-EB. Status of ratification and Links with Montreal Protocol and Gothenburg Protocol to Abate Acidification. Eutrophication and Ground-level Ozone. Kyoto protocol: Objective, Status of Ratification, Flexible mechanisms. Economic potential: Economics of market mechanisms : CDM , JI and ET. Political barriers and Amendments to the Kyoto Protocol. Clean energy and energy efficiency related regulations and Forestry regulations.

17. CLIMATE CHANGE & INTERNATIONAL RESPONSE , RESPONSIBILITY

Response to public enquiries and complaints, Setting, process and carrying out an audit. Environmental Audit: Overall environmental management, Environmental audit programme in India. History of UNEP, IPCC and UNFCCC, UNICEF, WHO, WMO. United Nations Conference on the Human Environment and United Nations Conference on Environment and Development (UNCED). The climate change convention, Paris agreement, COPs. Sustainable Development Goals (SDGs); Overview of SDGs, Integration of SDGs into National and State policies. International government responses, Developed V/s developing country. Life cycle analysis, Role of environmentalist. Footprint and Handprint concept. Youth participation and engagement activities, youth organization and membership opportunities. Interventions and conferences and guideline development for regular participation

18. CLIMATE ACTION:

Pro-Climate Action around the World. Global Initiatives, Policies, and its adaption: Net Zero Roadmap, Green Climate Fund (GCF) and Green Taxes, National Adaption Programs of Action (NAPA), National Adaption plans (NAP). Climate Action by Private Sector. Climate Action and India: Energy: NSM, GWRE, NMEEE, FAME-II, UJALA, ISA. Climate Action and India: Sustainable Rural and Urban Development: National mission on Sustainable Habitat, Swachhh Bharat Abhiyan, AMRUT, Smart Cities, Ujjwala Yojana, Mission LiFE (Lifestyle for environment). Climate change policy of countries, Uncertainty and Policy implications. Cost-benefit analysis in the context of climate change. Climate

Action and India Agriculture and Forest: GIM, PM-KUSUM Yojana, NMSA, NICRA. Climate Action and India : National Action Plan on Climate Change (NAPCC), India's Forest Policy and Climate Change, National Renewable Energy Act, 2015. Climate Funding and Budget. Gujarat State Action Plan on Climate Change (SAPCC): Objectives and Framework, Implementation Strategies, State-specific Initiatives and Projects. Gujarat Renewable Energy Climate Change Policies: Gujarat Solar Power Policy 2015, Gujarat Wind Power Policy 2016, Gujarat Small Hydel Policy 2016, Gujarat Waste to Energy Policy 2016, Gujarat Ecology Commission, Gujarat Renewable Energy Policy, 2023. Disaster Management and National Adaptation Fund: Disaster Management Act, 2005, Climate Change and Natural Disasters, Mitigation and Adaptation Strategies, National Adaptation Fund for Climate Change (NAFCC)- Objectives and Functions, Major Projects and Implementations, Role of NAFCC in Climate Change Mitigation. Constitutional Aspects and Legal Framework: Protection and Improvement of Environment, Fundamental Duty to Protect Environment, Right to Life and Personal Liberty (Environmental Jurisprudence), Judicial Pronouncements and Case Laws, Environment Impact Assessment Notification.

19. CLIMATE CHANGE MONITOR & MANAGEMENT:

Introduction to GIS techniques : Satellites , Sensors, Platforms and Resolutions, Infrared and Microwave. GIS applications based on models outputs and GIS databases. Remote Sensing : Principles and Applications, Interpreting Optical Remote Sensing Images. Projection of climate change scenarios and Tools for mapping and monitoring. Remote sensing technologies to monitor climate change processes (vegetation biomass, monitoring flooding, soil moisture and depth, surface micro topography etc.) Remote sensing datasets and satellite based monitoring systems, parameters of oceanography. Environmental Impact Assessment: Concept, Screening, scoping, prediction and mitigation, management and monitoring. Preparing an Environmental Statement, Making a planning application and consultation, Projects considered within the town and country planning regime, Local planning authorities. Procurement policy, Materials management, Water and wastewater management. Waste management, Noise monitoring and control, Air quality monitoring and control, Emergency response procedures. Transportation and travelling, Staff awareness and training, Publicity of environmental information. Energy Management: Principles of Energy Management, Energy Audits, Energy Conservation Act, 2000 (India), Gujarat Energy Development Agency (GEDA)

20. FUTURE CLIMATE SCENARIOS

Environmental Risk Assessment, Concept hazard identification, dose-response evaluation, exposure assessment. Risk characterization, Risk evaluation, Risk communication, Public perception of risk. Integrated Assessment Modeling- Country-wise Case studies. Policy makers : Speculators. Load sharing: Burden, Sandbag, Equity. Ethics: The perfect moral storm and its relevance on Climate Change. Collaborative Program on the Ethical Dimensions of Climate Change, Climate Justice. SDGs, Awareness programs, Public awareness, National and local government responses. Adaptive response and mitigation activity. Methods and ecology, economics and ethics: the missing links

21. Current Trends and Recent Advancement in the above fields.