



ગુજરાત જાહેર સેવા આયોગ

છ-૩ સર્કલ પાસે, છ રોડ, સેક્ટર-૧૦/એ, ગાંધીનગર-૩૮૨૦૧૦

જાહેરાત ક્રમાંક : ૪૪/૨૦૨૦-૨૧

જગ્યાનું નામ : વૈજ્ઞાનિક અધિકારી, વર્ગ-૨

ભાગ-૧ અને ભાગ-૨ ના ૧૮૦ મિનિટના સંયુક્ત પ્રશ્નપત્રની પ્રાથમિક કસોટીનો અભ્યાસક્રમ

ભાગ-૧ પ્રાથમિક કસોટીનો સામાન્ય અભ્યાસક્રમ		
માધ્યમ : ગુજરાતી	કુલ પ્રશ્નો : ૧૦૦	કુલ ગુણ : ૧૦૦
૧	ભારતની ભૂગોળ - ભૌગોલિક, આર્થિક, સામાજિક, કુદરતી સંસાધન અને વસ્તી અંગેની બાબતો - ગુજરાતના ખાસ સંદર્ભ સાથે	
૨	ભારતનો સાંસ્કૃતિક વારસો - સાહિત્ય, કલા, ધર્મ અને સ્થાપત્યો- 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 ફરજો (૩) રાજ્યનીતિના માર્ગદર્શક સિદ્ધાંતો (૪) સંસદની રચના (૫) રાષ્ટ્રપતિની સત્તા (૬) રાજપાલની સત્તા (૭) ન્યાયતંત્ર (૮) અનુસૂચિત જાતિ, અનુસૂચિત જનજાતિ અને સમાજના પછાત વર્ગો માટેની જોગવાઈઓ (૯) એટર્ની જનરલ (૧૦) નીતિ આયોગ (૧૧) પંચાયતી રાજ (૧૨) નાણાં પંચ (૧૩) બંધારણીય તથા વૈજ્ઞાનિક સંસ્થાઓ- ભારતનું ચૂંટણી પંચ, સંઘ લોક સેવા આયોગ, રાજ્ય લોક સેવા આયોગ, કોમ્પ્ટ્રોલર એન્ડ ઓડિટર જનરલ; કેન્દ્રીય સતર્કતા આયોગ, લોકપાલ તથા લોકાયુક્ત અને કેન્દ્રીય માહિતી આયોગ	
૬	સામાન્ય બૌદ્ધિક ક્ષમતા કસોટી	
૭	સામાન્ય વિજ્ઞાન, પર્યાવરણ અને ઇન્ફર્મેશન એન્ડ કોમ્યુનિકેશન ટેકનોલોજી	
૮	ખેલ જગત સહિત રોજબરોજના પ્રાદેશિક, રાષ્ટ્રીય અને આંતરરાષ્ટ્રીય મહત્વના બનાવો	

Part-1 Syllabus of Preliminary Test

Advt. No. 44/2020-21

Post : Scientific Officer, Class-II

Medium: Gujarati

Questions – 100

Total Marks- 100

1	Geography of India-Physical, Economic, Social, Natural Resources and population related topics- with special reference to Gujarat
2	Cultural heritage of India-Literature, Art, Religion and Architecture- with special reference to Gujarat
3	History of India with special reference to Gujarat
4	Indian Economy and Planning
5	<u>Indian Polity and the Constitution of India:</u> 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 Castes, Scheduled Tribes and backward classes of the society 9. Attorney General 10.NITI Aayog 11.Panchayati Raj Institutions 12.Finance Commission 13.Constitutional and Statutory Bodies: Election Commission of India, Union Public Service Commission, State Public Service Commission, Comptroller and Auditor General; Central Vigilance Commission, Lokpal and Lokayukta, Central Information Commission
6	General Mental Ability
7	General Science, Environment and Information & Communication Technology

Part-2 Syllabus of Concerned Subject for Preliminary Test

Advt. No. 44/2020-21

Post : Scientific Officer, Class-II

Marks – 200

Questions – 200

Medium - English

1. Chemistry

Analytical Chemistry

Analytical Objectives, Data Handling and Good Laboratory Practice (GLP), Sampling and Calibration Methods, Fundamentals of Spectrophotometry, Applications of Spectrophotometry, Sample Preparation Techniques, Chromatographic Methods, pH metry and Conductometry, Potentiometry and Ion-selective electrodes.

Inorganic Chemistry

Quantum theory and Atomic Structure, Symmetry and Group Theory, Magnetochemistry, Bio-inorganic Chemistry, Chemical Bonding, Application of symmetry, Organometallic Compounds, Reaction Mechanism

Organic Chemistry

Elimination Reaction, Nucleophilic Substitution Reaction, Aromaticity, Acid base concept, Reactive intermediates, Rearrangements, Stereo Chemistry, Spectroscopy, Photochemistry, Chemistry of Heterocycles, Name reactions, Reagents in organic synthesis.

2. Microbiology

Microbial Diversity and Physiology: Principles of microbial diversity, Principles of physiology, Physiological and metabolic diversity of microorganisms and their importance, Microbial diversity and physiology of extreme environment.

Microbial Biochemistry and Genetics: Advances in metabolism and regulation, Biosynthesis and regulation, Bacterial genetics and plasmid biology, Genetics of microorganisms

Microbial Growth, Enzymology and Bioinstrumentation: Microbial growth, Enzymology I, Enzymology II, Bioinstrumentation.

Immunology and Biostatistics: Major histocompatibility complex, Immune disorders and immunological techniques, Principles of biostatistics, Design of statistical experiments and analysis of co-variance.

Biochemical Engineering and Bioinformatics: Fermentor design and mass transfer, Fermentation kinetics and control, Bioinformatics, Applications of bioinformatics

Molecular Biology and Genetic Engineering : Concepts of molecular biology, Gene expression and regulation, Fundamentals of genetic engineering, Cloning and expression

Bioprocess Technology: Elements of bioprocess, Upstream processing, Downstream processing, Scale-up of bioprocess.

Microbial Technology: Microbial production of organic acids, solvents and beverages, Microbial production of therapeutic agents, Microbial production of enzymes, vitamins and amino acids, Other microbial products

3. Biochemistry

Instrumentation and Techniques: Radiolotopic Techniques, Chromatography /Centrifugation, Electrophoresis, Spectroscopic techniques.

Molecular Cell Biology, Bioenergetics and Intermediary Metabolism, Advanced Enzymology

Microbial Biochemistry: Introduction to Microbiology and Microorganisms, Microbial Taxonomy, Morphology, Reproduction and Significance, Microbial Physiology and Genetics.

Plant Biochemistry: Cytology and Evolution: Membrane Systems, Plant Physiology : Growth and Development, Plant Ecology, Plant Breeding.

Nutritional Biochemistry: Basic Concepts, Minerals, Protein Energy malnutrition (PEM), Clinical nutrition.

Human Physiology: Blood, Transfer of blood gases, Digestive system, Excretory system

4. Environmental Science

Natural and Biological Environment: Biological Communities and Ecosystem, Terrestrial Biomes and Forest Resources, Mineral and Food

Resources, Conservation of Natural Resources and Environmental Management, Natural and Biological Environmental

Environmental Issues and Impacts: The Atmosphere and Acid Rain, Stratospheric Ozone and Tropospheric Chemistry, Global Warming and Climate Change, Radiation Hazardous and Environmental Degradation.

Energy and Environment: Energy Flow and Equilibrium, Energy Production and Management, Non-Conventional and Biological Energy, Energy from Wastes.

Environment and Soil: Soil Composition, Formation and Morphology, Physical Properties of Soil, Soil Water Properties, Chemical and Acidic Properties of Soil.

Integrated Solid Waste Management: Basic Concepts of Solid Waste Management and Volume Reduction Technologies, Recycling of Solid Waste, Composting and Landfilling of Municipal Solid Waste, Hazardous Waste.

Aquatic and Marine Environmental Chemistry: Fundamentals of Aquatic and Marine Chemistry, Contamination and Pollutants in the Marine Environment, The Oceans and Climate, Remote Sensing and Geographical Information and Positioning System.

Air Pollution: Quality and Control Methods: Sources and Effects of Air Pollution, Sampling and Measurement of Air Pollutants, Air Pollution Control Methods and Equipment, Indoor Air Quality.

5. Biological Science (Life Science)

Molecules and their interaction relevant to Biology, Cellular Organization, Fundamental Processes, Cell Communication and Cell Signaling, Developmental Biology, System Physiology-Plant, System Physiology-Animal, Inheritance Biology, Diversity of Life Forms, Ecological Principles, Evolution and Behavior, Applied Biology, Methods in Biology

6. Water Quality Assessment

➤ Water and its Quality Parameters

Chemistry of water – Water resources – Hydrological cycle – Water quality parameters and drinking standard – Physical, Chemical quality of drinking water – Biological quality of drinking water.

➤ **Water Analysis**

Water composition analysis – Hardness testing – pH- Salinity- Turbidity – TDS – Conductivity testing – Minerals – BOD, COD, DO, Coli forms – Culture identification – MPN test -Microscopy: principles and practices – Staining methods. Water borne pathogen: Types and Detection – Potability of water.

➤ **Water Pollution and Management**

Environmental pollution – Definition -Types – Water pollution – Causes- Industrial and domestic effluents – Pesticides – Health hazards – Waterborne diseases. Control measures- Agencies of water quality testing- TWAD – Pollution Control Boards (State and Central) –Duties and responsibilities – Water testing labs- Environmental law: concepts.

➤ **Water treatment – Treatment of water:**

Flowchart of water treatment plant, Treatment methods (Theory and Design) – Physico-chemical treatments: Sedimentation, Coagulation-flocculation, Settling tanks, Disinfection systems: Chemicals- Chlorination and other disinfection methods, UV, Ozonation, aeration and gas transfer; precipitation; softening; adsorption and ion exchange; Reverse osmosis technologies membrane processes, Ultra filtration.

➤ **Practical Analytical Methods**

Introduction to analytical laboratory – Safety, Equipments and techniques used in laboratory, Determination of hardness, pH, turbidity, conductivity, DO, BOD and COD, Analysis of metals and ions, Microbiological analysis, MPN analysis.

7. Uniform Drinking Water Quality Monitoring Protocol of Government of India.

8. Current Trends and Recent Advancements in the Relevant Field.