

જા.ક.: ૪૩/૨૦૧૭-૧૮

જગ્યાનું નામ :- તાંત્રિક સલાહકાર (રસાયણ), વર્ગ-૧

(ઉદ્યોગ અને ખાણ વિભાગ)

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

પ્રાથમિક કસોટીનો અભ્યાસક્રમ	
ભાગ-૧	
માધ્યમ: ગુજરાતી	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) રાજ્યપાલની સત્તા (૭) ન્યાયતંત્ર (૮) અનુસૂચિત જાતિ, અનુસૂચિત જનજાતિ અને સમાજના પછાત વર્ગો માટેની જોગવાઈઓ (૯) એટર્ની જનરલ (૧૦) નીતિ આયોગ (૧૧) પંચાયતી રાજ (૧૨) નાણા પંચ (૧૩) બંધારણીય તથા વૈધનિક સંસ્થાઓ- ભારતનું ચૂંટણી પંચ, સંઘ લોક સેવા આયોગ, રાજ્ય લોક સેવા આયોગ, કોમ્પ્રોલર એન્ડ ઓડિટર જનરલ; કેન્દ્રીયસતર્કતા 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

Syllabus of Preliminary Test

Part-1

Medium: Gujarati

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	<u>Indian Economy and Planning</u>
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) NITIAayog (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
8	Daily events of Regional, National and International Importance including Sports

Part-II (Subject Related Syllabus)

Syllabus for Preliminary Test for the recruitment of Technical

Advisor (Chemical), Class I

Advt.No.: 43/2017-18

Total Questions:200

Total Marks:200

Medium: English

1. Fundamentals of Chemical Engineering Unit Operations

Types of Unit operations, Fluid Flow Operation, Mechanical Operation, Heat Transfer Operation, Mass Transfer Operations

2. Advanced Kinetics and Reaction Engineering

Introduction, Heterogeneous Reactions, Fluidised Bed Reactors, Multiphase Reactors, Bubble Column Reactor, Design of Reactors, Monolithic Reactors.

3. Industrial Biotechnology

Introduction to Industrial Bioprocess, Strain Improvement and Media Preparation, Fermentation Process, Production of Primary and Secondary Metabolites, Production of Modern Biotechnological Products.

4. Property Prediction for Mixtures (PPM)

Introduction to Polymer Processing, Mixing, Principles, Blending and Blending Equipment, Batch Compounding Equipment, Continuous Compounding Equipment, Calendars, Molding & Casting, Other Processing Methods. Estimation and Computation of Thermodynamic and Transport Properties, Density, Fluid Phase Equilibrium Properties, Heat Capacity and Enthalpy, Viscosity, Thermal Conductivity, Diffusion Coefficient, Surface Tension.

5. Polymer Materials & Testing (PMT)

Identification, Testing & Evaluation of Rubbers, Plastics and Fibers, Mechanical Properties, Electrical Properties, Thermal Properties, Environmental Resistance Properties.

6. Chemical Process Optimization

Introduction, Optimization of Unconstrained Functions One, Multivariable Search – Analytical Methods, Numerical, Non-Linear Programming With Constrained and Its Applications, Application of Optimization in Chemical Engineering, Non-traditional Optimization Techniques, Statistical Optimization Techniques.

7. Energy & Mass Integration (EMI)

Estimation and Computation of Thermodynamic and Transport Properties, Density, Fluid Phase Equilibrium Properties, Heat Capacity and Enthalpy, Viscosity, Thermal Conductivity, Diffusion Coefficient, Surface Tension.

8. Environment: Introduction, Nature of environment and its problem due to over utilization of natural resources. Environmental degradation, Greenhouse effect, acid rain, Ozone depletion, Photochemical smog. Environmental problems in India, Environment management and laws. Impact of Technology on the environment. **Environmental Pollution:** Types, classification, causes, effects and remedies. Various Acts, Rules and Regulation for Pollution Control and Protection of environment. The National Green Tribunal. Industrial waste water treatment and effluent treatment plan (ETP), Waste water recycling, sewage treatment. Solid waste Management and E-waste Management.

9. **Ecology and Ecosystem:** Ecology- Objectives, classification, concepts, structure, function and components of ecosystem, Bio-Geo- Chemical Cycles, Energy Flow in Ecosystem Food Chains, Major Ecosystems, Population & Natural Resources.

10. **Fundamentals of Drilling Engineering**
Drilling Rig: Components, Selection and Operating systems. Drilling Fluids – Basics, Functions, Classification, Properties and Nature. Drilling fluids equipment related to pressure and separation. Drill String, Casing string, drill bits and Wellhead Equipment. Cementing, Cements & cement slurry.

11. **Fundamentals of Production Engineering**
Introduction, Well Perforation, Well Completion, Well Testing and Activation, Introduction to Artificial lift techniques.

12. **Petroleum reservoir fluids and rock properties**
Reservoir fluid Composition, Thermodynamic behavior of hydrocarbon system both gas and liquid, vapour liquid equilibria, PVT analysis, evaluation and correlation of physical properties of petroleum reservoir fluids. Introduction to reservoir media, Fundamental concepts and mathematical expressions of relative permeability, Salient features of Gas-Oil and Water, Fundamentals and classification of flow in porous media, Single phase and multiphase fluid flow in different state (steady and unsteady) and different system (linear, radial) considering compressible, slightly compressible and incompressible fluid.

13. **Indian policy on Hydrocarbon:** Exploration and Licensing Policy (HELP). Drilling Contracts, Farm-in and Farm-out, Joint ventures, Union and State government schemes related to Industries and Fuel.

14. **Economic System and Business**

Economic System: capitalism, socialism and mixed economy, National Income, Monetary and Fiscal Policy (finance commission), Industrial Policy, Union Budget, Social Environment, Technological Environment, International Business Environment.

15. Small Business & Management of MSMEs

Concept & Definition, Role of Small Business in the modern Indian Economy, Small entrepreneur in International business; Steps for starting a small industry, registration as SSI, Role of India Infrastructure Finance Company, SIDBI etc.; advantages and problems of SSIs; Institutional Support mechanism in India; Incentives & Facilities, Govt. Policies for SSIs, Setting MSMEs- location of enterprise - steps in setting - Problems of entrepreneurs - Sickness in small industries - reasons and remedies - Incentives and subsidies - Evaluating entrepreneurial performance - Rural entrepreneurship - Women Entrepreneurship.

16. Organizational setup and functions of various departments/ divisions/ institutions/ boards under Ministry of Commerce and Industry and Ministry of Micro, Small and Medium Enterprises. Ministry of Environment, Forest and climate change, its role, legal framework and various institutions working under it. National and Environment policy- 2006, Environment, Clearance and Environment Impact Assessment. United Nations Environment Programme (UNEP).

17. Various Government Policies and Acts:

New Industrial Policy, 2015 of Government of Gujarat, State Government's Cluster Development Policy and various R & D institutions, State Government's Cottage and Rural Industries Policy 2016, The Micro, Small and Medium Enterprises Development Act, 2006, The Gujarat Special Economic Zones Act, 2004, The Gujarat Industrial Development Act, 1962 etc.

- 18. Various Schemes for Industrial Development of Central Government and Gujarat State Government.**
- 19. Application of E-Governance and ICT in Industries.**
- 20. Current Trends and Recent Advancements in Industrial Development.**