જગ્યાનું નામ: નિમ્ન વૈજ્ઞાનિક અધિકારી(ખોરાક), ગુજરાત ઔષધ સેવા, વર્ગ-૧(જા.ક્ર.૫૬/૨૦૨૩-૨૪)

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

સીધી પસંદગીથી ભરતીની પ્રાથમિક કસોટીનો અભ્યાસક્રમ ભાગ-૧ (સામાન્ય અભ્યાસ)		
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	
૨	ભારતનો સાંસ્કૃતિક વારસો- સાહિત્ય, કલા, ધર્મ અને સ્થાપત્યો- ગુજરાતના ખાસ સંદર્ભ સાથે	
૩	ભારતનો ઈતિહાસ- 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) નીતિ આયોગ (૧૦) બંધારણીય તથા વૈધાનિક સંસ્થાઓ- ભારતનું ચૂંટણી પંચ, કોમ્પટ્રોલર એન્ડ ઓડિટર જનરલ, માહિતી આયોગ	૩૦
૬	સામાન્ય વિજ્ઞાન, પર્યાવરણ અને ઈન્ફર્મેશન 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. (૩) સંબંધ વિષયક પ્રશ્નો. (૪) આકૃતિઓ અને તેના પેટા વિભાગ, વેન આકૃતિઓ (૫) ઘડીયાળ, કેલેન્ડર અને ઉમર સંબંધિત પ્રશ્નો. (૬) સંખ્યા વ્યવસ્થા અને તેના માનક્રમ. (૭) રૈખિક સમીકરણ (એક કે બે ચલમાં) (૮) પ્રમાણ, હિસ્સો અને ચલ. (૯) સરેરાશ યા મધ્યક, મધ્યસ્થ અને બહુલક, ભારિત સરેરાશ. .	૩૦

	(૧૦) ઘાત અને ઘાતાંક, વર્ગ, વર્ગમૂળ, ઘનમૂળ, ગુ.સા.અ. અને લ.સા.અ (૧૧) ટકા, સાદુ અને ચક્રવૃદ્ધિ વ્યાજ, નફો અને નુકશાન. (૧૨) સમય અને કાર્ય, સમય અને અંતર, ઝડપ અને અંતર. (૧૩) સરળ ભૌતિક આકૃતિઓના ક્ષેત્રફળ અને પરિમિતિ, જથ્થો અને સપાટીનો વિસ્તાર (છ સમાંતર બાજું ઘરાવતો ઘન, ઘન, સિલિન્ડર, શંકુ આકાર, ગોળાકાર). (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. (૧૫) બીજગણિતનો પરિચય-BODMAS-કાનાભાગુવઓ-વિચિત્ર પ્રતિકોની સરળ સમજુતિ. (૧૬) માહિતીનું અર્થઘટન, માહિતીનું વિશ્લેષણ, માહિતીની પર્યાપ્તતા, સંભાવના	
૯	ગુજરાતી વ્યાકરણ (૧) જોડણી (૨) સમાનાર્થી-વિરૂધ્ધાર્થી શબ્દો (૩) રૂઢિપ્રયોગો અને કહેવતો (૪) સમાસ (૫) સંધિ (૬) અલંકાર (૭) છંદ	૧૦
૧૦	English Grammar (1) Articles, Pronouns, Adjectives, Prepositions, Conjunctions and Question tag. (2) Verb and Tense, Agreement between subject and verb, Gerund, Participles. (3) Modal auxiliaries. Usage of can, may, could, should, etc. (4) Use of some, many, any, few, a little, Since and for. (5) Active and passive voice (6) Degrees of adjectives. (7) Common errors of usage.	૧૦

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

Syllabus for Preliminary Test for Recruitment By Direct Selection Part-1(General Studies)		
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 Principals 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 Impotance 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	30

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

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

Part-2 (Concerned Subject)

Syllabus for the post ofJunior Scientific Officer(Food),Gujarat Drugs Service, Class-I (Advt. No. 56/2023-24)

Marks – 200 Questions – 200 Medium - English

1. Principles of Food Processing

Principles of food processing operations. Historical development, status of food processing in India; sources of food and their classification. Processing technology of food grains, fats & oils and related products, fruits, vegetables, milk, milk products, meat, poultry, eggs, sea-foods, bakery, beverages, confectionery, chocolate products, spices and plantation crops.

Design and formulation of foods: concepts and recent trends in food formulation, infant foods, weaning foods, Indian traditional sweet and snack food products; therapeutic foods for special demographic groups; geriatric food; foods for persons suffering from various ailments; antioxidant rich food products; foods for drought and disaster afflicted; defense services, sportsmen, space food etc.

2. Principles of Food Preservation

Overview of food preservation methods and their underlying principles including novel and emerging methods/principles: thermal processing, canning, drying, aseptic processing; freezing; irradiation; extrusion; baking and roasting; crystallization; membrane processing; hurdle technology; minimal processing, pulsed electric field processing, high pressure processing, cold plasma processing, ohmic heating processing and ultrasound processing.

Antimicrobial preservative and added preservatives.

Organic acid and their salts: propionates, benzoates, sorbates, acetates, nitrites and nitrates, sulfur dioxide and sulphites, ethylene and propylene oxides, sugars and salts, alcohol, formaldehyde, spices and other condiments,

Overview of food additives with respect to their technological functions and antibiotics.

3. Principles of Packaging

Overview of food packaging methods and principles including novel packaging materials/technique. Food packaging technology and equipment: functions and marketing consideration for a package; types of packaging materials; manufacturing of packaging materials and packages; properties of packaging material; selection criteria of packaging materials; machinery for packaging; package labelling; shelf life of packaged food; quality testing of packaging material etc.

4. Fermented Foods, Functional Foods and Nutraceuticals

Microbiology of fermented milk - starter lactic cultures, fermented milk products: yogurt, butter and cheese, other fermented foods: idly, bread etc.

Nutritional value of fermented foods.

Microorganisms as food: single cell protein, edible mushrooms.

Probiotics; definition and uses. Functional foods and nutraceuticals: concepts and definition; functional colonic foods; functional fats and spreads; functional confectionery; dietary fiber; manufacturing of functional foods and nutraceuticals; packaging and labelling; specific nutrient claims; disease-specific claims;

Dietary Supplement Health and Education Act (DSHEA).

5. Principles and Basics of Food Chemistry and their Role in Human Nutrition

Structure and functions of macro and micronutrients. Role of macro and micronutrients in human nutrition.

Overview of anti-nutritional factors and their removal from foods. Overview of enzymes as food processing aids.

Overview of food contaminants and adulterants and their effects on human health. Food allergens and allergenicity. Importance of diet in alleviating health risks, especially non-communicable diseases.

6. Food Microbiology and General Principles of Food Hygiene

General principles of food microbiology. Sources of microorganisms in the food chain (raw materials, water, air, equipment, etc.) and microbiological quality of foods. Microbial food spoilage: general principles of food spoilage; underlying spoilage of food; microbes involved in spoilage of foods.

Foodborne diseases: Infections/Intoxications. General principles and techniques in the microbiological examination of foods. Overview of beneficial microorganisms and their role in food processing and human nutrition.

Food plant sanitation: Importance of sanitation in food plants, sanitation laws, guidelines and sanitary practices; food contamination and spoilage: classification of food on the basis of shelf life; personal hygiene and safety; cleaning compounds and sanitizers; sanitization methods; pest control in food plant; sanitary design and construction for food processing plant; water quality and treatment; regulatory agencies in sanitation.

General principles of food safety management systems including traceability and recall-sanitation, HACCP, Good production and processing practices (GMP, GAP, GHP, GLP, BAP, etc.).

7. General concepts of Food Analysis and Testing

Sampling and sample preparation: Definition, types of sample, sampling plan, subsampling, designing sampling plan, concept of sample size and representative. Sample preparations - particle size, homogeneity, dissolution technology and decomposition, storage of samples. Solid Phase Extraction - Introduction, sorbents, matrix solid phase dispersion and applications.

Statistics and statistical terms: Systematic and random errors. Mean distribution. Confidence interval. Confidence limits and confidence level, outliers. Definition and calculation of: Average, Mean, Standard deviation, Relative standard deviation, Coefficient of variation, Confidence limits of a measurement, Statistical Tests, Linear correlation and regression curve fitting, fitting of linear equations. Choosing and using statistical tests, Analysis of Variance (ANOVA).

Basic principles of classical methods of food analysis: Law of mass action, Le chateliers principle, stoichiometry, volumetric and gravimetric analysis. Preparation of standards, working standards and solutions of known concentration (percent, molar, molal, normal, ppm and ppb) and their dilution. Proximate analysis, physical methods for extraneous matter analysis.

Classical analytical techniques: Gravimetry, Titrimetry, Refractometry and Polarimetry: Principle, Instrumentation and applications of each technique in food analysis.

Modern analytical techniques: UV-Visible and Fluorescence Spectrometry, Raman spectroscopy, Chromatographic techniques: Principles and applications of paper (Ascending, Descending, Radial, Two dimensional) Partition, Thin layer chromatography, HPTLC, size

exclusion and ion exchange chromatography, High Performance Liquid Chromatography (HPLC), Gas chromatography (GC), Mass Spectrometry, Hyphenated Techniques, Atomic Absorption Spectroscopy (AAS), Atomic emission Spectroscopy, ICP-MS, Biological Techniques (DNA/protein based).

8. Principles of Quality assurance and Quality Control with reference to Food Analysis and Testing

Quality factors in foods: appearance factors, textural factors, flavor factors, additional quality factors, quality standards. Measurements of rheological properties: Instrumental measurement of texture of foods, viscos analysis, viscometer, texture analyser etc. Introduction to quality control in analytical chemistry. Terminology in analytical measurements: True value, Measured value, Accuracy, Precision, Uncertainty, Random errors. Sample traceability, Internal quality control, Certified reference materials. Spiked reference samples. Recovery studies. Method validation/verification (LOD, LOQ, specificity, selectivity, linearity, range, robustness, repeatability, reproducibility, External and internal standards; Control chart, Proficiency testing, Z scores.

9. Indian and International Food Laws: An Overview

Food Safety and Standards Act of India, 2006: Provision, definitions, and different sections of the Act and implementation.

FSS Rules and Regulations:

Licensing and registration; Standards of Quality and Safety of Food & Food Products laid down in the FSS Regulations, 2011; Regulations of food additive; Packaging and labelling rules and regulations; Regulations for Contaminants;

Food Safety and Standards (Food or Health Supplements, Nutraceuticals, Foods for Special Dietary Uses, Foods for Special Medical Purpose, Functional Foods and Novel Food) Regulations, 2016, Food Safety and Standards (Food Recall Procedure) Regulations 2017, Food Safety and Standards (Import) Regulations, 2017.

Food Safety and Standards (Organic Food) Regulation, 2017. Food Safety and Standards (Fortification of Foods) Regulations, 2018, Food Safety and Standards (Alcoholic Beverages) Regulations, 2018.

Laboratory sampling and analysis: The role of Referral labs, FSSA notified laboratories and State Food Laboratories and function. Receiving legal samples, sample custody and sample custodian. Storage of sample. Required documentation and registration, storage of the sample Analyses as per FSS Rules and Regulations (2011).

Overview of other relevant national bodies (e.g. APEDA, BIS EIC, MPEDA, Spice Board, etc.): Agricultural Produce Act, 1937 (Grading and Marketing), Export (Quality Control & Inspection), Act, 1963 and Rules, Bureau of Indian Standards relevant to Food Safety (Water, Infant Formula etc.), Legal Metrology Act.

International Food Control Systems/Laws, Regulations and Standards/Guidelines with regard to Food Safety- Overview of CODEX Alimentarius Commission (History, Members, Standard setting and Advisory mechanisms: JECFA, JEMRA JMPR): WTO agreements (SPS/TBT): CODEX Alimentarious Commission: History, Members, Standard setting and Advisory mechanisms: JECFA, JEMRA, JMPR. WTO agreements: SPS/TBT. Role of OIE, IPPC.

10. Planning Organization and setting up of Food Analysis Laboratory, Accreditation and Laboratory Safety.

Requirements for setting up a laboratory for the legal defensibility of analytical data. The ideal structure design, environment, layout for chemical and microbiological testing, air handling etc.

Accreditation: Different accreditation bodies (NABL, APLAC, ILAC). Requirements for ISO/IEC 17025:2017, documentation, pre-requisites for accreditation, management requirements, technical requirements, measurement of traceability.

Laboratory safety: Personnel and laboratory hygiene, emergency planning, general hazards in a food laboratory, safety equipment, storage of chemicals, acids, flammables etc., handling compressed gases, centrifuge, chemical and biological spills and waste disposal.

11. CURRENT TRENDS AND RECENT ADVANCEMENT IN THE ABOVE FIELDS.