लोक सेवा आयोग

नेपाल कृषि सेवा, फूड न्यूट्रिशन एण्ड क्वालिटी कन्ट्रोल समूह, राजपत्रांकित तृतीय श्रेणीका पदहरुको खुला प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

यस पाठ्यक्रम योजनालाई दुई चरणमा विभाजन गरिएको छ :

प्रथम चरण :–	लिखित परीक्षा (Written Examination)	पूर्णाङ्क :– २००
द्वितीय चरण :-	(क) सामूहिक परीक्षण (Group Test)	पूर्णाङ्क :– १०
	(ख) अन्तर्वार्ता (Interview)	पूर्णाङ्क :– ३०

परीक्षा योजना (Examination Scheme)

प्रथम चरण : लिखित परीक्षा(Written Examination) **पूर्णाङ्क :– २००**

पत्र	विषय	खण्ड	पूर्णाङ्क	उर्तीर्णाङ्क	परीक्षा प्रणाली		प्रश्नसंख्या ×अङ्क	समय
प्रथम	General Subject	Part I: General Awareness & General Reasoning Test	१००	४०	वस्तुगत (Objective)	बहुवैकल्पिक प्रश्न (MCQs)	५० प्रश्न ×१ अङ्क	१ घण्टा ३० मिनेट
		Part II: General Technical Subject					५०प्रश्न ×१ अङ्क	
द्वितीय	Technical Subject		१००	४०	विषयगत (Subjective)	छोटो उत्तर लामो उत्तर	४ प्रश्न × ५ अङ्क ८ प्रश्न ×१०अङ्क	३ घण्टा

द्वितीय चरण : सामूहिक परीक्षण (Group Test) र अन्तर्वार्ता (Interview) **पूर्णाङ्क :– ४०**

पत्र /विषय	पूर्णाङ्क	उर्तीर्णाङ्क	परीक्षा प्रणाली	समय
सामूहिक परीक्षण (Group Test)	१०		सामूहिक छलफल (Group Discussion)	३० मिनेट
अन्तर्वार्ता (Interview)	३०		बोर्ड अन्तर्वार्ता(Board Interview)	-

द्रष्टव्य :

१. लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुनेछ ।

२. प्रथमपत्र र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।

३. वस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नहरुको गलत उत्तर दिएमा प्रत्येक गलत उत्तर बापत २० प्रतिशत अङ्क कट्टा गरिनेछ । तर उत्तर नदिएमा त्यस बापत अङ्क दिइने छैन र अङ्क कट्टा पनि गरिने छैन ।

४. बहुवैकल्पिक प्रश्नहरु हुने परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन ।

५. विषयगत प्रश्नहरुको हकमा तोकिएको अंकको एउटा लामो प्रश्न वा एउटै प्रश्नका दुई वा दुई भन्दा बढी भाग (Two or more parts of a single question) वा एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरु (Short notes) सोध्न सकिने छ ।

६. द्वितीय पत्रमा(विषयगत प्रश्न हुनेका हकमा) प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरु हुनेछन् । परिक्षार्थीले प्रत्येक खण्डका प्रश्नहरुको उत्तर सोहीखण्डको उत्तरपुस्तिकामा लेख्नुपर्नेछ ।

७. यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकै लेखिएको भए तापनि पाठ्यक्रममा परेका कानून, ऐन, नियम तथा नीतिहरु परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्क्रममा परेको सम्झनु पर्दछ ।

८. प्रथमचरणको परीक्षाबाट छनौट भएका उम्मेदवारहरुलाई मात्र द्वितीयचरणको परीक्षामा सम्मिलित गराइनेछ ।

९. यस भन्दा अगाडि लागु भएका माथि उल्लेखित सेवा, समूहको पाठ्यक्रम खारेज गरिएको छ ।

१०. पाठ्यक्रम लागू मिति : **२०८०/०७/२०**

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प्रथम पत्र (Paper I): General Subject

Part (I) : - General Awareness & General Ability Test (50 Marks)

1. **General Awareness and Contemporary Issues (25 ×1 Mark = 25 Marks)**
   - 1.1 Physical, socio-cultural and economic geography and demography of Nepal
   - 1.2 Major natural resources of Nepal
   - 1.3 Geographical diversity, climatic conditions, and livelihood & lifestyle of people
   - 1.4 Notable events and personalities, social, cultural and economic conditions in modern history of Nepal
   - 1.5 Current periodical plan of Nepal
   - 1.6 Information on sustainable development, environment, pollution, climate change, biodiversity, science and technology
   - 1.7 Nepal's international affairs and general information on the UNO, SAARC & BIMSTEC
   - 1.8 The Constitution of Nepal (From Part 1 to 5 and Schedules)
   - 1.9 Governance system and Government (Federal, Provincial and Local)
   - 1.10 Provisions of civil service act and regulation relating to constitution of civil service, organisational structure, posts of service, fulfillment of vacancy and code of conduct
   - 1.11 Functional scope of public services
   - 1.12 Public Service Charter
   - 1.13 Concept, objective and importance of public policy
   - 1.14 Fundamentals of management : planning, organizing, directing, controlling, coordinating, decision making, motivation and leadership
   - 1.15 Government planning, budgeting and accounting system
   - 1.16 Major events and current affairs of national and international importance

2. **General Reasoning Test (25 ×1 Mark = 25 Marks)**

   2.1 **Logical Reasoning** (9×1 Mark = 9 Marks)

   Verbal Ability, Alphanumeric Series, Reasoning Analogies, Classification, Coding-Decoding, Order & Ranking, Distance & Directions, Analytical and Logical Reasoning, Assertion and Reason, Statement and Conclusion, Input-Output, Venn- diagram

   2.2 **Numerical Reasoning** (8×1 Mark = 8 Marks)

   Arithmetic Series, Analogy, Classification, Arithmetical Reasoning, Fraction. Percentage, Ratio, Average, Profit & Loss, Time & Work, Date & Calender, Data Sufficiency, Data Interpretation & Data Verification

   2.3 **Spatial Reasoning** (8×1 Mark = 8 Marks)

   Figure Series, Figure Analogy, Figure Classification, Figure Matrix, Pattern Completion, Embedded Images, Image Formation & Analysis, Mirror and Water Images, Cubes and Dices, Paper Folding & Cutting

Part (B) : - General Technical Subject (50 Marks)

1. Food Chemistry 26%

1.1 Historical development of food chemistry
1.2 Proximate composition of foods and their determination
1.3 Structure, classification and properties of carbohydrates. Physical and chemical properties of monosaccharides and disaccharides. Structure of different polysaccharides (starch, pectin, cellulose, hemicellulose). Properties of starch, gel formation, retrogradation of starch, modified starch, amylase and amylopectin
1.4 Structure, classification and properties of proteins. Classification and properties of amino acids, essential and non essential amino acids, denaturation of proteins
1.5 Structure, classification and properties of lipids. Saturated and unsaturated fatty acids, reactions of unsaturated fatty acids, rancidity, autoxidation, flavour reversion
1.6 Classification and properties of vitamins. Occurrence of minerals in food
1.7 Structure of water, hydrogen bond, free water, bound water, water activity and its importance in food
1.8 General properties and classification of enzymes, enzymes in food industry, enzymatic browning, non-enzymatic reactions, caramelization, Maillard reaction
1.9 Natural pigments in food (chlorophyll, carotenoids, anthocyanins), artificial food colours, synthetic coal tar dyes and their assessment of safe limit
1.10 Principal flavouring compound in food, threshold value, flavour enhancers
1.11 Other food additives used in food industries: antioxidants, emulsifiers, preservatives, stabilizers, anti caking agents, thickening agents, chelating agents, anti foaming agents, artificial sweeteners (saccharine, aspartame, cyclamate, dulcin)
1.12 General introduction to flavonoids and alkaloids

2. Food Microbiology 24%

2.1 Principle and application of the polarizing microscope, ultraviolet microscope, phase contrast microscope, electron microscope
2.2 Morphology and cytology of bacteria, yeasts, molds, viruses and protozoa
2.3 Growth, reproduction, transformation, mutation and spore formation of micro organism
2.4 General principles of serology and immunology
2.5 Mutation and gene function at the molecular level, genetic recombination.
2.6 Bacterial nutrition and metabolism
2.7 General morphological and physiological characteristics of yeasts. Identification characteristics of Saccharomyces and Endomyces
2.8 Identification characteristics of food spoilage microorganisms (Salmonella species, E. coli, Staphylococcus species., Pseudomonas species), identification of Aspergillus, Penicillum, Rhizopus species
2.9 Microbiology of meat, fish, poultry and their products, milk and milk products, fruit and vegetable products, fast foods, cereals and cereal products, spices, tea and coffee
2.10 Environmental microbiology (air, water and soil)
2.11 Hurdle concept of food safety
2.12 Food borne infection and intoxication. Biotoxins : aflatoxins, fuminosin, ochratoxin, zearalenon

3 Biochemistry and Nutrition 26%

3.1 Digestion, absorption, metabolism and functions of carbohydrates, proteins and lipids
3.2 General properties of enzymes, coenzymes and factors, enzyme kinetics and mechanism of action, inhibitors and activators
3.3 Biochemical functions of nucleic acids, elementary notions of protein biosynthesis
3.4 Nutritional importance of vitamins, minerals, trace elements, essential fatty acids and essential amino acids. Protein Efficiency Ratio (PER), Net Protein Utilization (NPU), Chemical Score
3.5 Nutritional classification of food. Food groups, balance diet and application of food composition table
3.6 Nutritional requirements and recommended dietary allowances of infants, preschool children, pregnant and lactating mother
3.7 Importance of mother's milk in child nutrition. Baby foods, infant foods, weaning foods, supplementary foods
3.8 Assessment of nutritional status and their indicators
3.9 Major nutritional deficiency diseases

4. Food Engineering 24%

4.1 Units, dimensions and their conversion
4.2 Unit operation, heat and material balance, heat transfer (conduction, convection and radiation) and heat exchangers
4.3 Laws of thermodynamics and it’s applications
4.4 Flow of fluids, laminar and turbulent flow, Newtonian and non-Newtonian fluids, selection of pumps. Principle and application of rheology and rheometry
4.5 Principle, application and equipments for refrigeration & freezing, drying, evaporation, centrifugation, size separation (filtration, sedimentation), size reduction (crushing, slicing, grinding)
4.6 Principle and application of distillation, extraction and super critical fluid extraction
4.7 General introduction to belt conveyers, chain conveyers, screw conveyers, elevators and their importance in food industries
4.8 Steam generation and it’s application in food industries
4.9 Principle of extrusion cooking and it’s use in food industries
4.10 High pressure technology, membrane technology (Reverse Osmosis and Ultra Filtration) and its application in food industries
4.11 Process plant and equipment design, scale-up and safety factors