

**नेपाल खाद्य संस्थान**  
अधिकृत स्तर ७ तह वरिष्ठ अधिकृत गुण नियन्त्रक पदको खुला/आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम  
एवं परीक्षा योजना

पाठ्यक्रमको रूपरेखा :- यस पाठ्यक्रमको आधारमा निम्नानुसार चरणमा परीक्षालिइने छ :

प्रथम चरण :- लिखित परीक्षा

पूर्णाङ्क :- २००

द्वितीय चरण :- अन्तर्वार्ता

पूर्णाङ्क :- ३०

१. प्रथमचरण: - लिखित परीक्षा					पूर्णाङ्क :- २००	
पत्र	विषय	पूर्णाङ्क	उतीर्णाङ्क	परीक्षा प्रणाली	प्रश्नसंख्याXअङ्क	समय
प्रथम	व्यवस्थापन र सम्बन्धित कानून	१००	४०	विषयगत	१०प्रश्नX १० अङ्क = १०० अङ्क	३ घण्टा
द्वितीय	सेवा सम्बन्धी	१००	४०	विषयगत	६प्रश्नX १०अङ्क = ६० अङ्क	३ घण्टा
					२प्रश्नX २० अङ्क = ४० अङ्क (समस्या समाधान)	
२. द्वितीय चरण : -अन्तर्वार्ता						
	विषय	पूर्णाङ्क	उतीर्णाङ्क	परीक्षा प्रणाली		
	अन्तर्वार्ता	३०	-	मौखिक		

**द्रष्टव्य :**

- लिखित परीक्षाको माध्यमभाषा नेपालीवाअंग्रेजीअथवा नेपाली र अंग्रेजीदुवै हुनेछ ।
- प्रथम र द्वितीयपत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।
- लिखित परीक्षामायथासम्भव पाठ्यक्रमका सबै एकाईबाट प्रश्नहरु सोधिनेछ ।
- विषयगतप्रश्नमाप्रत्येकपत्र/विषयकाप्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरु हुनेछन् । परीक्षार्थीले प्रत्येक खण्डका प्रश्नहरुको उत्तर सोही खण्डका उत्तरपुस्तिकामा लेख्नुपर्नेछ ।
- यस पाठ्यक्रम योजनाअन्तर्गतकापत्र/विषयकाविषयवस्तुमा जेसुकै लेखिएको भएतापनि पाठ्यक्रममा परेकाकानून, ऐन, नियमतथानीतिहरु परीक्षाको मितिभन्दा ३ महिना अगाडि (संशोधनभएकावा संशोधनभई हटाईएकावाथप गरी संशोधनभई) कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ ।
- प्रथमचरणको परीक्षाबाट छनौट भएकाउम्मेदवारहरुलाई मात्रद्वितीयचरणको परीक्षामा सम्मिलित गराइनेछ ।
- पाठ्यक्रमलागू मिति :-

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प्रथमपत्र :- व्यवस्थापन र सम्बन्धितकानून

खण्ड (क) – (५० अङ्क)

१. सार्वजनिक व्यवस्थापन

- १.१ व्यवस्थापनको अवधारणा, प्रकार र आधारभूत सिद्धान्तहरू
- १.२ मानवश्रोत व्यवस्थापन : प्राप्ति, विकास, उपयोग र सम्भार
- १.३ व्यवस्थापनमानिर्देशन, नियन्त्रण, समन्वय, निर्णय प्रक्रिया, उत्प्रेरणा, नेतृत्व अधिकार प्रत्यायोजन
- १.४ कुशलव्यवस्थापककाकार्य र गुणहरू
- १.५ व्यवस्थापकीय सीप र शैलीहरू
- १.६ कार्यसम्पादनव्यवस्थापन
- १.७ ज्ञानव्यवस्थापन
- १.८ श्रोत व्यवस्थापन
- १.९ योजनातर्जुमा, कार्यान्वयन, अनुगमनएवं मूल्यांकनप्रक्रिया
- १.१० आर्थिक प्रशासनको अर्थ, क्षेत्र, प्रमुखकार्यहरू र महत्व
- १.११ बजेटको अर्थ, सिद्धान्त, प्रकार र महत्व
- १.१२ लेखा र लेखा परीक्षणको अवधारणा, उद्देश्य र महत्व
- १.१३ विश्वव्यापीकरण, उदारीकरण र निजीकरण
- १.१४ सार्वजनिक - नीजि साभेदारी

२. व्यवसायिकता, सदाचार र नैतिकता

- २.१ सार्वजनिकजवाफदेहिता र उत्तरदायित्व
- २.२ व्यवसायिकता, सदाचार र नैतिकताको अवधारणा र आयामहरू
- २.३ सार्वजनिकप्रशासनमाव्यवसायिकता, सदाचार र नैतिकताको प्रबर्द्धनकाउपाय र वर्तमानअवस्था
- २.४ भ्रष्टाचार निवारण तथा भ्रष्टाचार निवारणका लागिगर्एकाव्यवस्थाहरू

खण्ड (ख) – (५० अङ्क)

३. संविधान, ऐन र नियमहरू तथाखाद्य संस्थान सम्बन्धी

- ३.१ नेपालको वर्तमान संविधान, २०७२
- ३.२ संस्थान ऐन, २०२१
- ३.३ नेपालखाद्य संस्थानकार्यालय सञ्चालनतथाकर्मचारी सेवाशर्त र सुविधा सम्बन्धीविनियमावली २०६४
- ३.४ खाद्य ऐन, २०२३ र खाद्यनियमावली, २०२७
- ३.५ करार ऐन, २०५६
- ३.६ कम्पनी ऐन, २०६३
- ३.७ उपभोक्ता संरक्षण ऐन, २०५४ र उपभोक्ता संरक्षण नियमावली, २०५६

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- ३.८ वातावरण संरक्षण ऐन, २०५३ र वातावरण संरक्षण नियमावली, २०५४
- ३.९ स्ट्याण्डर्ड नाप र तौल ऐन, २०२५ र स्ट्याण्डर्ड नाप र तौल नियमावली, २०२७
- ३.१० नेपाल गुणस्तर प्रमाण चिन्ह ऐन, २०३७ र नेपाल गुणस्तर प्रमाण चिन्हनियमावली, २०४०
- ३.११ सार्वजनिकखरिद ऐन, २०६३ र सार्वजनिकखरिद नियमावली, २०६४
- ३.१२ विदेशीलगानीतथाप्रविधि हस्तान्तरण ऐन, २०४९
- ३.१३ भ्रष्टाचार निवारण ऐन, २०५९
- ३.१४ दाना ऐन २०३३ र दानानियमावली, २०४१
- ३.१५ पशु वधशाला र मासु जांच ऐन, २०५५ ,
- ३.१६ आयोडिनयुक्त नून (उत्पादनतथाबिक्रीवितरण ) ऐन, २०५५
- ३.१७ जीवनाशकविषादी ऐन , २०४८
- ३.१८ आमाको दूधलाई प्रतिस्थापनगर्ने वस्तु (बिक्रीवितरण नियन्त्रण) ऐन , २०४९
- ३.१९ नेपालखाद्य संस्थानको परिचय, संगठनात्मक संरचना, कार्यक्षेत्र, विद्यमानअवस्था, सम्भावना र चुनौतीहरु
- ३.२० अन्तर्राष्ट्रिय खाद्यतथा कृषि सम्बन्धी संघ संस्थाहरु: इफड (IFAD),खाद्यतथा कृषि संगठन (FAO),विश्वखाद्यकार्यक्रम(WEP) रविश्वव्यापार संगठन (WTO) सम्बन्धीजानकारी
- ३.२१ नेपालमाखाद्यान्नउत्पादनको वर्तमानअवस्था, माग र आपूर्ति तथाबजार व्यवस्था
- ३.२२ खाद्य सुरक्षा र खाद्य सम्प्रभुता

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द्वितीयपत्र:- सेवा सम्बन्धी

**1. Bio/Food Chemistry and Nutrition**

- 1.1 Historical development of food chemistry
- 1.2 Proximate composition of foods and their determination
- 1.3 Structure, classification and properties of carbohydrates; starch, amylase and amylo-pectin
- 1.4 Structure, classification and properties of proteins, amino acids and enzymes; coenzymes and factors, enzyme kinetics and mechanism of action, inhibitors and activators, non-enzymatic reactions, enzymes in food industry
- 1.5 Structure, classification and properties of lipids; fatty acids, rancidity, auto-oxidation, flavour reversion
- 1.6 Classification and properties of vitamins; occurrence of minerals in food
- 1.7 Structure of water, water activity and its importance in food
- 1.8 Artificial food colours, synthetic coal tar dyes and their assessment of safe limit
- 1.9 Principal flavouring compound in food, threshold value, flavour enhancers
- 1.10 Food additives used in food industries: antioxidants, emulsifiers, preservatives, stabilizers, anti caking agents, thickening agents, chelating agents, anti foaming agents, artificial sweeteners
- 1.11 General introduction to flavonoids and alkaloids
- 1.12 Digestion, absorption, metabolism and functions of carbohydrates, proteins and lipids
- 1.13 Nutritional classification of food, food groups, balance diet, food composition table, essential fatty acids and essential amino acids, Protein Efficiency Ratio, Net Protein Utilization, Chemical Score, Biological value
- 1.14 Baby foods, infant foods, weaning foods, supplementary foods
- 1.15 Nutritional status and their indicators
- 1.16 Food nutritional problems
- 1.17 Food security and nutrition
- 1.18 Food habits and food taboos
- 1.19 Anti-nutritional factors in food and their removal, food toxicity and allergenicity
- 1.20 Malnutrition, Under-nutrition, Double burden of malnutrition, Hidden hunger, Global hunger index, Lifestyle diseases
- 1.21 Effect of processing on nutrients
- 1.22 Supplementation, fortification and enrichment of foods
- 1.23 International convention on nutrition (ICN), World Food Summit, International agencies in nutritional activities

**2. Food Engineering**

- 2.1 Units, dimensions and their conversion; Unit operation, heat and material balance, heat transfer and heat exchangers
- 2.2 Laws of thermodynamics and its applications
- 2.3 Principle, application and equipments for refrigeration and freezing, drying, evaporation, centrifugation, size separation and size reduction
- 2.4 Principle and application of distillation and extraction
- 2.5 Introduction to belt conveyers, chain conveyers, screw conveyers, elevators and their importance in food industries
- 2.6 Steam generation and its application in food industries
- 2.7 High pressure technology, membrane technology (Reverse Osmosis and Ultra Filtration) and its application in food industries

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- 2.8 Process plant and equipment design, scale-up and safety factors especially on cereals, legumes and oil seeds processing
  - 2.9 Cereals, legumes and oil seeds : Structure, chemical composition, physical mechanical and thermal properties
  - 2.10 General milling operation : cleaning, separation, classification, husking, milling and grinding of wheat, legumes and corn
  - 2.11 Complete milling process, break rolls, reduction rolls, milled products and their nutritive value and applications
  - 2.12 Rice milling : Traditional and modern rice milling machines, husking, polishing, destoner, degree of polishing
  - 2.13 Principle and importance of parboiling of rice and wheat, merits and demerits of parboiling
  - 2.14 Processing of oil seeds (traditional & modern methods), refining, solvent extraction
  - 2.15 By-product utilization of cereal grains, legumes and oil seeds
- 3. Storage and Packaging Technology**
- 3.1 Grain sampling: theoretical basis, sampling devices and their applications, analysis of grain samples
  - 3.2 Food losses and damage during storage
  - 3.3 Entomology and mycology of stored grain insects, pest, fungi and mycotoxin
  - 3.4 Storage structures: principles, types, selection of storage building, physical, chemical, biological storage structure and handling of equipment
  - 3.5 Non-chemical control measure of stored food : grain seed and drying; modified atmosphere, hermetic storage and CA storage; refrigeration storage and aeration principle
  - 3.6 Chemical control methods of pest control
  - 3.7 Farm level storage and storage structure in Nepal
  - 3.8 Packing materials: properties and identification, paper and paper board, plastics films, aluminum foils, laminated packing and their importance
  - 3.9 Food packages: bags, pouches, wraps, folding cartons, set-up boxes, liquid-tight paper board containers, cans, collapsible tubes, glass containers, traditional packages
  - 3.10 Shipping and transporting container, wooden containers, corrugated fiber boxes, inserts and cushioning materials
  - 3.11 Process of Packaging and Equipment: Material handling, filling, air removal, sealing, retorting, modified atmosphere packaging, vacuum and gas packaging
  - 3.1 Special problems in packaging of food stuffs: perishable and non-perishable foods
  - 3.2 Packaging specification and quality control
  - 3.3 Evaluation of Packaging materials, toxicity, corrosion prevention, shelf life testing, minimization of transport losses; hazards in handling and storage and packaging and their minimization
  - 3.4 Packaging laws and Regulations
  - 3.5 Importance of packaging and labeling
- 4. Post Harvest and Food Processing Technology**
- 4.1 The broad-based approach to post- harvest and agro-industry development in Nepal
  - 4.2 Development, growth, maturation, ripening of cereals, pulses and oilseeds
  - 4.3 Post harvest handling of grains: Grading, storage and transportation of cereal grains

- 4.4 Qualitative and quantitative assessment of post harvest losses and management system for loss reduction in rice, maize, wheat, pulses and oilseeds
  - 4.5 GoN's current policy and plan for increase in agriculture production and strategy for development of food and nutrition security
  - 4.6 Introduction and historical development of food preservation
  - 4.7 Ancient and indigenous practices of food processing and preservation
  - 4.8 General principles and methods of food preservation
  - 4.9 Definition and types of food spoilage, process of food spoilage, and factors affecting spoilage of food
  - 4.10 Different types of food preservation methods (by low temperature, by thermal processing and by irradiation)
  - 4.11 Technology of cereal, legume and oil seeds.
  - 4.12 Uses of enzymes in food processing industries
  - 4.13 Use of various packaging materials in food processing
  - 4.14 Minimal processing for nutrients conservation
  - 4.15 Research on development of food preservation and appropriate technology.
- 5. Food Microbiology**
- 5.1 Principle and application of the microscope
  - 5.2 Morphology and cytology of bacteria, yeasts, molds, viruses and protozoa
  - 5.3 Growth, reproduction, transformation, mutation and spore formation of micro organism
  - 5.4 General principles of serology and immunology
  - 5.5 Bacterial nutrition and metabolism
  - 5.6 Identification characteristics of food spoilage microorganisms (Salmonella species, E. coli, Staphylococcus species., Pseudomonas species)
  - 5.7 Identification of Aspergillus, Penicillium, Rhizopus species
  - 5.8 Microbiology of cereals and cereal products, fast foods, spices, tea and coffee, meat, fish, poultry and their products
  - 5.9 Environmental microbiology (air, water and soil)
  - 5.10 Hurdle concept of food safety
  - 5.11 Food borne infection and intoxication; biotoxins - aflatoxins, fumonisin, ochratoxin, zearalenon
- 6. Industrial Microbiology**
- 6.1 Industrial application of micro-organisms and their identification
  - 6.2 Isolation and preservation of industrially important micro-organisms
  - 6.3 Fermented foods and beverages
  - 6.4 Bio-chemical reaction and fermentation
  - 6.5 Industrial fermentation of organic acids (vinegar, citric acid, lactic acid), amino acid (L-glutamic acid, L- lysine and L-tryptophan), and vitamins ( vitamin B-12, riboflavin,  $\beta$ - carotene)
  - 6.6 Industrial production and purification of enzymes (amylase, glucoamylase, dextrin sucrose)
  - 6.7 Single cell protein, antibiotics and chemistry of microbial leaching
  - 6.8 Recent trends and developments in biotechnology
- 7. Quality Control and Management**
- 7.1 Quality control, Quality assurance and Quality Management System
  - 7.2 Food Sampling and Inspection techniques

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- 7.3 Food adulteration and its control mechanism. Food safety and monitoring of contaminants in foods.
- 7.4 Quality attributes of food and sensory evaluation
- 7.5 Food standards and Codex Alimentarius Commission (COC), OIE & IPPC, WTO/SPS & TBT Agreements
- 7.6 Food plant sanitation and management
- 7.7 General principle and application of Hazard Analysis and Critical Control Point (HACCP), Good Manufacturing Practice (GMP), ISO- 9001, 22000, 50001, TQM&GAP/GAV standards
- 7.8 Good Laboratory Practices (GLP), Laboratory Accreditations, ILAC, APLAC, NEPLAS
- 7.9 Principle and application: Enzyme Linked Immuno Sorbent Assay (ELISA), Gas Chromatography(GC), High Performance Liquid Chromatography (HPLC), Atomic Absorption Spectroscopy (AAS), Mass Spectrometry (MS), Infra Red and Ultra Violet Spectroscopy
- 7.10 General concept of statistical quality control, sampling techniques, measures of location and dispersion, probability, test of significance (Chi-square test, T and Z tests, F-value)