

लोक सेवा आयोग

नेपाल इन्जिनियरिङ्ग सेवा, मेटालर्जिकल इन्जिनियरिङ्ग समूह, राजपत्रांकित तृतीय श्रेणीका पदको 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	उत्तीर्णाङ्क	परीक्षा प्रणाली		प्रश्नसंख्या × अङ्क	समय
प्रथम	General Subject	Part I: General Awareness & General Ability Test	१००	४०	वस्तुगत (Objective)	बहुवैकल्पिक प्रश्न (MCQs)	५० प्रश्न × १ अङ्क	१ घण्टा ३० मिनेट
		Part II: General Technical Subject					५० प्रश्न × १ अङ्क	
द्वितीय	Technical Subject		१००	४०	विषयगत (Subjective)	छोटो उत्तर लामो उत्तर	४ प्रश्न × ५ अङ्क ८ प्रश्न × १० अङ्क	३ घण्टा

द्वितीय चरण : सामूहिक परीक्षण (Group Test) र अन्तर्वार्ता (Interview)

पूर्णाङ्क :- ४०

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

द्रष्टव्य :

- लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुनेछ।
- प्रथमपत्र र द्वितीयपत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ।
- वस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नहरूको 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।
- बहुवैकल्पिक प्रश्नहरू हुने परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन।
- विषयगत प्रश्नहरूको 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 टिप्पणीहरू (Short notes) सोध्न सकिने छ।
- द्वितीय पत्रमा (विषयगत प्रश्न हुनेका हकमा) प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरू हुनेछन्। परिक्षार्थीले प्रत्येक खण्डका प्रश्नहरूको उत्तर सोही खण्डको उत्तरपुस्तिकामा लेख्नुपर्नेछ।
- यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकै लेखिएको भए तापनि पाठ्यक्रममा परेका कानून, ऐन, नियम तथा नीतिहरू परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ।
- प्रथम चरणको परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ।
- यस भन्दा अगाडि लागू भएका माथि उल्लेखित सेवा, समूहको पाठ्यक्रम खारेज गरिएको छ।
- पाठ्यक्रम लागू मिति : - २०७६/०७/२५

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 Ability Test (25 ×1 Mark = 25 Marks)**
 - 2.1 **Verbal Ability Test (8×1 Mark = 8 Marks)**
Jumble words, Series, Analogy, Classification, Coding-Decoding, Matrix, Ranking Order Test, Direction and Distance Sense Test, Common Sense Test, Logical Reasoning, Assertion and Reason, Statement and Conclusions
 - 2.2 **Numerical Ability Test (9×1 Mark = 9Marks)**
Series, Analogy, Classification, Coding, Arithmetical reasoning/operation, Percentage, Ratio, Average, Loss & Profit, Time & Work, Data interpretation & Data verification
 - 2.3 **Non-verbal/Abstract Ability Test (8×1 Mark = 8 Marks)**
Figure Series, Figure Analogy, Figure Classification, Figure Matrix, Pattern Completion/Finding, Analytical Reasoning Test, Figure Formation and Analysis, Rule Detection, Water images, Mirror images, Cubes and Dice & Venn-diagram

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

- 1. Basic concept of ores (10%)**
 - 1.1 Ores and ore-dressing
 - 1.2 Various ore-dressing and concentration operations: Froth Flotation, Gravity Separation, Magnetic Separation
 - 1.3 Common iron ores and associated impurities – SiO_2 , Al_2O_3 , CaCO_3
 - 1.4 Effects of Associated impurities in Blast Furnace operation
 - 1.5 Important ores of common non-ferrous metals – Al, Cu, Pb, Zn, Sn.

- 2. Basic Concept of Extractive Metallurgy (10%)**
 - 2.1 Pyrometallurgy
 - 2.2 Hydrometallurgy
 - 2.3 Electrometallurgy

- 3. Steel Making Process (10%)**
 - 3.1 Principle and process of steel making
 - 3.2 Role of Oxygen, Ferro-alloys, re-carburizer, de-oxidizer
 - 3.3 L.D, Bessemer, open-hearth and Electric process of steel making
 - 3.4 Common use of carbon steel-low carbon steel, mild steel, high carbon steel
 - 3.5 Stainless steel and effects of major alloying elements Ni, Cr.

- 4. Heat-treatment (10%)**
 - 4.1 Iron-carbon equilibrium phase diagram
 - 4.2 Purpose and process of hardening, tempering, normalizing, annealing
 - 4.3 Surface hardening/case-hardening – carburizing, nitriding, induction hardening, flame hardening

- 5. Metal Forming Process (10%)**
 - 5.1 Principle and purpose of hotworking
 - 5.2 Various hotworking processes – Rolling, Forging, Extrusion
 - 5.3 Principle and purpose of cold working
 - 5.4 Cold forming processes – cold rolling, shearing, drawing

- 6. Basic concept of Fuels and Furnaces (10%)**
 - 6.1 Types of fuels – solid, liquid and gaseous fuels
 - 6.2 Calorific value and its determination
 - 6.3 Solid fuels – coal, coke and effects of Sulphur and ash on fuel quality
 - 6.4 Fuel quality and effects on performance
 - 6.5 Common consideration for various electric-furnace design

- 7. Refractories (10%)**
- 7.1 Introduction and use of refractories
 - 7.2 Classification and properties of refractories
 - 7.3 Criteria of good refractory
 - 7.4 Refractory selection criteria for Pyrometallurgical technique of extractive metallurgy
- 8. Powder Metallurgy (10%)**
- 8.1 Principle and process of Powder metallurgy
 - 8.2 Specific application of Powder Metallurgical Products
 - 8.3 Merits and de-merits of Powder-Metallurgical products
 - 8.4 Common powder Metallurgical products
 - 8.5 Comparison and contrast with other process:-casting
- 9. Basic concept of atomic and molecular structure, bonding and alloy formation (10%)**
- 9.1 Structure of atoms and molecules
 - 9.2 Ionic, covalent, metallic and molecular bond
 - 9.3 Crystal structure – BCC, FCC, HCP and packing factor
 - 9.4 Alloy formation and equilibrium diagram for solid solution (Cu-Ni and Au-Cu system) and utetic (Sb- Pb and Ag-Pb system)
- 10. Welding, Brazing and Soldering (10%)**
- 10.1 Basic concept of welding, brazing and soldering
 - 10.2 Principle and process of gas welding – Oxyacetylene Welding
 - 10.3 Principle and process of Arc Welding – metal arc welding, inert gas arc welding, sub-merged arc welding
 - 10.4 Weldability of metals
 - 10.5 Use and applicability of brazing and soldering.