नेपाल आयल निगम लिमिटेड

खुला प्रतियोगितात्मक परीक्षाको लागि पाठ्यक्रम एवं परीक्षा योजना

स्तर : सहायक, **सेवा :** प्राविधिक, **समूह :** ल्याव, **तह :** ४, **पद :** सहायक (ल्याव)

पाठ्यक्रमको रुपरेखा : यस पाठ्यक्रमको आधारमा निम्नानुसार तीन चरणमा परीक्षा लिइनेछ ।

प्रथम चरण : लिखित परीक्षा पूर्णाङ्क : १००
द्वितिय चरण : प्रयोगात्मक परीक्षा पूर्णाङ्क : ५०
तृतीय चरण : अन्तर्वार्ता पूर्णाङ्क : २०

प्रथम चरण

विषय	परीक्षाको किसिम	पूर्णाङ्क	उत्तीर्णाङ्क	प्रश्नको किसिम	प्रश्न संख्या × अंक भार	समय
ल्याव सम्बन्धी	लिखित	१००	४०	बस्तुगत बहुउत्तर	२५×२=५०	२ घण्टा
				छोटो उत्तर	५×१०=५०	

द्वितिय चरण

विषय	परीक्षाको किसिम	पूर्णाङ्क	उत्तीर्णाङ्क	समय
ल्याव सम्बन्धी	प्रयोगात्मक	५०	२५	१ घण्टा

तृतीय चरण

अन्तर्वार्ता	मौखिक	२०	-	-

द्रष्टव्य

१. प्रथम चरण र द्वितिय चरणको परीक्षा अलग अलग हुनेछ ।
२. लिखित परीक्षाको माध्यम नेपाली वा अंग्रेजी अथवा अंग्रेजी र नेपाली दुवै भाषामा हुन सक्नेछ ।
३. यस पाठ्यक्रममा जे सुकै लेखिएको भएता पनि पाठ्यक्रममा परेका ऐन नियमहरूको परीक्षाको मिति भन्दा ३ (तीन) महिना अगाडि संशोधन भएका वा संशोधन भई हटाइएका वा थप गरी संशोधन भई) कायमरहेकालाई यस पाठ्यक्रममा रहेको सम्झनु पर्दछ ।
४. प्रयोगात्मक परीक्षाका लागि लिखित परीक्षामा सामेल भएका परीक्षार्थीहरू मध्येबाट लिखित परीक्षाको प्राप्ताङ्कको आधारमा १ देखि ५ पदसम्मका लाथि थप ५ जना र ६ भन्दा बढी पदका लागी दोब्बर संख्यामा उम्मेदवारलाई सामेल गराइनेछ ।
५. प्रयोगात्मक परीक्षाको उत्तीर्णाङ्क पूर्णाङ्कको ५०% हुनेछ र प्रयोगात्मक परीक्षा उत्तीर्ण नगर्नेलाई अन्तर्वार्तामा सहभागी गराइने छैन ।
७. पाठ्यक्रम लागू मिति : **२०७४ असोज २२ गते देखि**

परीक्षाको विस्तृत पाठ्यक्रम

A) Basics of Inorganic Chemistry

1. Periodic classification of s, p, d,f elements and discussion on various atomic properties.
2. Different classification of Acids and Bases
3. Solubility product and common ion principle.
4. Different Chromatographic technique and their application
5. Allotropes of carbon, Different oxides of carbon (CO, CO_2) and their properties.

B) Basics of Organic Chemistry

1. Aliphatic and aromatic compounds, electrophilic aromatic substitution reaction, structure and stability of benzene ring, 4^n+2 rule.
2. Study of organic compounds, structural ellucidation by uv, ir, nmr and mass techniques.
3. Determination of purity of organic compounds.
4. Classification, sources, nomenclature and types of hydrocarbons
5. General knowledge of petrochemical compounds, flash point, auto ignition temperature, octane number, anti-knocking property of fuel.

C) Basics of Physical Chemistry

1. Atomic structure, atomic mass unit, different theories of atomic structure.
2. Electronic concept of oxidation and reduction reactions, oxidation number, different methods of balancing chemical equations.
3. Postulates of kinetic molecular theory, Boyle's law, Charle's law, Ideal gas law, critical temperature and pressure.
4. Crystalline and amorphous solids, classification on the basis of dominant type of bond.
5. Difference between order and molecularity of a chemical reaction, concept of activation energy, temperature dependence of reaction rates, reaction mechanisms, catalysis.
6. First and Second law of thermodynamics, entropy and enthalpy of a reaction, free energy chance and criteria of spontaneity of a reaction.
7. Volumetric analysis
   7.1 Different ways of expressing the concrete of solution
      i. molarity ii. normality iii. molality iv. gram/liter v. percentage
   7.2 Tritation
      i. acid box titration ii. redox titration
   7.3 Primary standard substance, primary standard solution, secondary standard solution, end point, equivalence point, neutral point, indicator
   7.4 Different indicator in acid base titration and pH curve.

D) General

1. Treatment of analytical data
   Nature of analytical measurements, significant figures, precision and accuracy, errors, basic statistical concepts, average and measures of dispersion, standard deviation, confidence limits, elements of standards and measures. Data processing in spread sheets.
2. Laboratory management
   General idea of safety precaution in the laboratory, care and maintenance of laboratory equipments.
3. Hazardous chemical and chemical waste management
   Heptanes, acetic acid, petroleum ether, petroleum benzene, hydrochloric acid.
4. Role of chemist in Environmental Impact Assessment (EIA).
5. Good Laboratory Practice (GLP) in lab.

Practical

The candidates will be asked to perform laboratory works from the following topics:

Group	Topics	Marks	Time/Minutes
1.	Determination of Density of materials, refractive index, specific gravity, specific heat capacity and latent of materials and volume, weight etc using: different measuring tools and determination of the pH of different unknown solution & using pH paper and universal indicator..	20	45 minutes
2.	Separation of different materials from the given mixture, distillation to produce distillate, neutralize acid with proper solution, neutralize sodium hydroxide with HCl solution.	15	45 minutes
3.	Carrying out conductivity experiments on solids & liquids, distillation of petroleum products, determination of Flash point & Viscosity of Oil.	15	30 minutes
	Total	50	120 minutes (2 Hrs.)

नोट : माथिका प्रत्येक group बाट एउटा practical जाँच लिईनेछ । जाँचको क्रममा उम्मेदवारले उपकरणको प्रयोग विधि पनि गरेर देखाउनु पर्नेछ ।

***