

नेपाल आयल निगम लिमिटेड

खुला तथा आन्तरिक प्रतियोगितात्मक परीक्षाको लागि पाठ्यक्रम एवं परीक्षा योजना

स्तर : सहायक, सेवा : प्राविधिक, समूह : ल्याव, तह : ५, पद : वरिष्ठ सहायक (ल्याव)

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

लिखित परीक्षा	पूर्णाङ्क : १००
प्रयोगात्मक	पूर्णाङ्क : ५०
अन्तर्वार्ता	पूर्णाङ्क : २०

प्रथम चरण :

विषय	परीक्षाको किसिम	पूर्णाङ्क	उत्तीर्णाङ्क	प्रश्नको किसिम	प्रश्न संख्या × अंक भार	समय
ल्याव सम्बन्धी	लिखित	१००	४०	बस्तुगत बहुउत्तर	५०×१=५०	२ घण्टा
				छोटो उत्तर	५×१०=५०	

द्वितीय चरण :

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

तृतीय चरण :

विषय	किसिम	पूर्णाङ्क	उत्तीर्णाङ्क	समय
अन्तर्वार्ता	मौखिक	२०	-	-

द्रष्टव्य

१. प्रथम चरण र द्वितीय 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 लागि थप ५ जना र ६ भन्दा बढी पदका लागि 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

1. Acids and bases: Bronsted and Lewis acid-base concept, 'hard and soft acids and bases, relative strengths of acids and bases and effect of substituent and solvents on them, p^H and H^+ ion concentration.
2. Refining and ' purification of metals: Chromatography, ion exchange, solvent extraction, oxidative refining, parting process, zone refining, Mond's process, fractional distillation.
3. Liquid state: Vapour pressure, vapour pressure and boiling point, surface tension and its determination-using Staiagnometer, viscosity and determination by- Ostwald viscometer, applications of surface tension and viscosity measurements, flash point.
4. Solid state: Crystalline and amorphous solids, classification of solids on the basis of dominant type of bond, hygroscopic, water of crystallization, seven types of crystal system.
5. Chemical Kinetics; Concept of rate of reaction, dependence of reaction rate on concentration, measurement of reaction rate, order -and molecularity of a reaction, rate equations for zero; first and second order reactions, the temperature dependence of reaction rates, reaction mechanisms, catalysis, average rate and instaneous rate of reaction, concept of activation energy.
6. Chemical change and chemical equations: Type of chemical change, factors governing chemical change, chemical equations.
7. Thermodynamics: First law of thermodynamics, enthalpy of physical and chemical change, entropy, spontaneous and non spontaneous change, second law of thermodynamics, entrops asa measure of randomness, free energy change, criteria of spontaneity.
8. Hydrogen: Position of hydrogen in the periodic table, technical preparation, Laboratory preparation from acids. ,
9. Oxygen: 'Position in, the periodic table, laboratory preparation, from compound containing high percentage of oxygen, properties, applications, oxides.
10. Water: Hard arid soft water, removal of hardness, composition of water, structure solvent property of water.
11. Carbon Mono-oxide and Carbon Dioxide: Preparation, properties and applications
12. Sulphur: Structure of sulphur "
13. Hydrogen sulphide and sulphur dioxide:' Preparation properties and applications
14. Sulphuric Acid: Properties and applications
15. Phosphorus: Know about red and white phosphorus
16. Isolation and purification of organic compounds: Sources of compound, characteristics of organic compound, Extra action of organic substances from natural sources, purification, crystallization, sublimation, distillation, steam distillation, washing drying, criteria of purify.
17. Hydrocarbon:
Classification of hydrocarbon, source of hydrocarbon, nomenclature, aliphatic and ammatic hydrocarbon, general knowledge of petrochemical compound, fossil fuels, flash point, outoignition temperature, octane number, cetane number, anti knocking properties of petrochemicals.
18. Purification of organic compound:
Method of purification of crude organic compound, determination of purity of organic compound, principle and practice behind identification of functional group in organic compound

19. Laboratory management
ISO 17025; general idea of safety precaution in lab, care and maintenance of lab equipments, handling of laboratory equipments
20. Distillation of petroleum products
Freezing point of Aviation Turbine Fuel (ATF)
21. Environmental pollution:
Air pollution, physicochemical smog, acid rain, water pollution, green house effect
22. Chemistry in service to mankind
* Polymer: definition, natural and synthetic polymers, homopolymer, copolymer, preparation of some polymer, prepolyethenl polystyrene, teflon, nylonce, bakelite and their uses/properties.
* Dyes: Definition, natural and synthetic dyes, name and structure of common drugs, drug addiction.
* Fertilizer: definition, chemical and organic fertilizer, fertilizer as pollution.
* Pesticides: Insecticides, herbicides, unedicides and fungicides. (example and their use)
23. Hazardous chemical and chemical waste management
Heptanes, acetic acid, petroleum ether, petroleum benzene, hydrochloric acid, methyl isobutyl ketone
24. Role of chemist in Environmental Impact Assessment (EIA).
25. Laboratory Management
General idea of safety precaution in laboratory, care and maintenance of laboratory equipments.
26. Basic knowledge of computer application

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 and recover the crystal of NaCl and investigating the composition of water by electrolysis.	15	45 minutes
3.	Carrying out conductivity experiments on solids & liquids, distillation of petroleum products, determination of Flash point & Viscosity of Oil. Preparing primary standard solution of Na ₂ CO ₃ and standardize the given acid solution HCl by the standard solution.	15	30 minutes
	Total	50	120 min. (2 Hrs.)

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