

लोक सेवा आयोग  
नेपाल इञ्जिनियरिङ्ग सेवा, केमिकल समूह, राजपत्राङ्क द्वितीय श्रेणीको  
(आन्तरिक र खुला प्रतियोगिता) लिखित परीक्षाको पाठ्यक्रम

द्वितीय पत्र: प्राविधिक विषय

- 1. Unit Process:**
  - a. Nutration, Halogination, Oxidation, Hydrogenation, Esterification, Alkylation
- 2. Thermodynamics:**
  - a. Thermodynamic laws, its functions
  - b. General Equations of Equilibrium
  - c. Pressure Volume Temperature Relations of Fluids
- 3. Heat Transfer:**
  - a. Conduction, Convection and Radiation
  - b. Temperature
  - c. Counterflow: Double-pipe exchangers
  - d. 1-2 Parallel counterflow: shell and tube exchangers
- 4. Mass Transfer:**
  - a. Distillation
  - b. Evaporation
  - c. Crystallization
  - d. Extraction
- 5. Petroleum Technology:**
  - a. Composition of Petroleum
  - b. Classification of refinery products
  - c. Cracking, performing, Isomerisation
- 6. Fuels:**
  - a. Solid
  - b. Liquid
  - c. Gas
- 7. Plastic Technology:**
  - a. Plastics and their definitions
  - b. Ingredients of plastics or moulding powders
  - c. Different classification of plastics and Resins, its manufacture
  - d. Use of plastics and resins in industry and engineering

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**8. Cement Technology:**

- a. Definition of Portland cement, Raw materials and its manufacture in detail
- b. Flow sheet diagram for cement manufacture, setting or hardening of cement and different theories
- c. Specifications for Portland cement (Nepal Standard), Analysis of cement and its use
- d. Lime, plaster of Paris, Gypsum- manufacture and its use

**9. Pulp and paper Manufacturing & its uses:**

- a. Raw materials for paper
- b. Pulping methods
- c. Different type of Paper
- d. Paper quality and tests

**10. Oils and Fats:**

- a. Vegetable oils and fats
- b. Hydrogenation of Oils
- c. Fat splitting
- d. Soap and Synthetic detergents
- e. Lacquer oils

**11. Paints, Varnishes and Lacquers**

- a. Types of Paints and its Raw Materials
- b. Paints Manufacture
- c. Varnishes and its characteristics
- d. Lacquers and its composition
- e. Lacquer oils

**12. Natural and Synthetic Rubber**

- a. Classification of Rubber
  - b. Chemistry and Properties of natural Rubber
  - c. Synthetic Rubber, Rubber compounding
  - d. Rubber Reclaiming, Reclaiming Agents
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