

Section A- 30 Marks

1. Ores, ore-dressing, concentration and conversion

- 1.1 General understanding of availability of various ores in Nepal
- 1.2 Various ore-dressing and concentration operations – Froth Floatation, Gravity separation, Magnetic separation and criteria of their selection
- 1.3 Objective, principle and process of calcining and roasting with example
- 1.4 Principle, purpose and process of smelting with example
- 1.5 Fire-refining and electrolytic refining of metal
- 1.6 Ores of copper, Zinc, Lead, Tin, Silver, Aluminum and Iron

2. Extractive Metallurgy

- 2.1 Physico-chemical principles of Extractive Metallurgy
- 2.2 Principle and process of Pyro-metallurgical technique as applied to copper, zinc, lead extraction
- 2.3 Principle and process of Hydor-metallurgical technique as applied to noble metal-Gold, Silver.
- 2.4 Principle and process of Electro-metallurgical technique as applied to Aluminum extraction

Section B- 20 Marks

3. Foundry Technology

- 3.1 Introduction of casting process
- 3.2 Purpose and process of casting
- 3.3 Pattern design and core-making
- 3.4 Properties of moulding sand
- 3.5 Advantage and limitations of sand casting
- 3.6 Common casting Defects and remedial methods
- 3.7 Principle, process and utility of die-casting and Centrifugal casting
- 3.8 Process description, merits and demerits of investment casting or Lost wax casting
- 3.9 Use of grey cast iron and white cast iron

Section C- 20 Marks

4. Testing of metals and alloys

- 4.1 Stress-strain diagram, proof stress, yield strength, tensile strength and percentage elongation with reference to mild steel
- 4.2 Purpose and process of creep, impact and fatigue strength test
- 4.3 Hardness, hardenability and hardness testing methods-Brinell, Rockwell, Vickers
- 4.4 Various non –destructive testing methods and their utility

लोक सेवा आयोग
नेपाल इन्जिनियरिङ्ग सेवा, मेटालर्जिकल इन्जिनियरिङ्ग समूह, राजपत्रांकित तृतीय श्रेणीका पदहरुको खुला र
आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम
Section D- 30 Marks

5. Standardization, quality management and environment management and laboratory accreditation

- 5.1 Concept, principles, aim and level of standardization
- 5.2 Types of standards
- 5.3 National standard development process of Nepal
- 5.4 Concept and need of quality management system
- 5.5 Principles of quality management systems
- 5.6 ISO 9001 standard and its element
- 5.7 Concept and need of environmental management system
- 5.8 ISO 14001 standards and its elements
- 5.9 Concept and need of laboratory accreditation

6. ऐन नियमहरु

- 6.1 वातावरण संरक्षण ऐन, २०५४
- 6.2 वातावरण संरक्षण नियमावली, २०५५
- 6.3 नेपाल गुणस्तर प्रमाण चिन्ह ऐन, २०३७
- 6.4 नेपाल गुणस्तर प्रमाण चिन्ह नियमावली, २०४०
- 6.5 स्ट्यान्डर्ड नाप र तौल ऐन, २०२५
- 6.6 स्ट्यान्डर्ड नाप र तौल नियमावली, २०२७
- 6.7 निजामती सेवा ऐन, २०४९
- 6.8 निजामती सेवा नियमावली, २०५०
- 6.9 उपभोक्ता संरक्षण ऐन, २०५४
- 6.10 उपभोक्ता संरक्षण नियमावली, २०५६
- 6.11 खाद्य ऐन, २०२३
- 6.12 खाद्य नियमावली, २०२७

द्वितीय पत्रहरुका एकाइहरुबाट सोधिने प्रश्नसंख्या निम्नानुसार हुनेछ :

द्वितीय पत्रका खण्ड	A		B	C	D	
द्वितीय पत्रका एकाई	1	2	3	4	5	6
प्रश्न संख्या	2	1	2	2	2	1

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विषयगत नमूना प्रश्नहरू (Sample questions)

1. Highlight the identified ores in Nepal
2. Explain the difficulties in commercial exploitation of identified ore deposit of Nepal
3. Concentration by Froth Flotation is highly favoured for Sulphide ores. Explain in detail with example
4. Explain why hydro-metallurgical technique is not suitable for Aluminum extraction
5. Explain any five in brief
 - 5.1 Role of coke in production of Pig iron in Blast Furnace
 - 5.2 Roasting of copper ore before smelting
 - 5.3 Role of Cryolite in Aluminum Production
 - 5.4 Role of Silica (SiO_2) and slag formation in smelting process
 - 5.5 Necessity of laboratory accreditation
 - 5.6 Use of refractories in pyrometallurgical process
 - 5.7 Quality management system
6. What are the common casting defects and how those can be minimized?
7. What are the merits and demerits of sand cast products?
8. Compare and contrast stress-strain diagram for mild steel and cast iron. Highlight the significant differences
9. Name the 8 principles of quality management system and explain how those can be useful for organizational effectiveness and continual improvement.
10. What do you mean by IEE (Initial Environment Examination) and EIA (Environment Impact Assessment)? What is the purpose of conducting IEE and /or EIA?