

लोक सेवा आयोग
नेपाल इन्जिनियरिङ्ग सेवा, माइनिङ्ग इन्जिनियरिङ्ग समूह, राजपत्राङ्कित तृतीय श्रेणीको खुला र आन्तरिक
प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

पाठ्यक्रमको रूपरेखा :- यस पाठ्यक्रमको आधारमा निम्नानुसार दुई चरणमा परीक्षा लिइने छ :

प्रथम चरण :- लिखित परीक्षा पूर्णाङ्क :- २००
द्वितीय चरण :- अन्तर्वार्ता पूर्णाङ्क :- ३०

प्रथम चरण – लिखित परीक्षा योजना (Examination Scheme)

| पत्र | विषय | पूर्णाङ्क | उत्तीर्णाङ्क | परीक्षा प्रणाली | प्रश्न संख्या X अङ्कभार | समय |
|---------|---------------------------|-----------|--------------|---------------------------------------|-------------------------|---------------------|
| प्रथम | माइनिङ्ग इन्जिनियरिङ्ग | १०० | ४० | वस्तुगत बहुउत्तर (Multiple Choice) | १००X१ = १०० | १ घण्टा १५ मिनेट |
| द्वितीय | | १०० | ४० | विषयगत (Subjective) | १०X१० = १०० | ३ घण्टा |

द्वितीय चरण

| विषय | पूर्णाङ्क | परीक्षा प्रणाली |
|------------------------|-----------|-----------------|
| व्यक्तिगत अन्तर्वार्ता | ३० | मौखिक |

- लिखित परीक्षाको माध्यम भाषा अंग्रेजी वा नेपाली, अथवा अंग्रेजी र नेपाली दुवै हुन सक्नेछ ।
- माथि उल्लिखित समूहको पाठ्यक्रमको प्रथम तथा द्वितीय पत्रको विषयवस्तु फरक फरक हुनेछ ।
- प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।
- प्रथम तथा द्वितीय पत्रहरूका एकाईहरूबाट सोधिने प्रश्नसंख्या निम्नानुसार हुनेछ :

| | | | | | | | | | |
|---------------------|----|----|----|----|---|----|----|---|----|
| प्रथम पत्रका एकाई | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| प्रश्न संख्या | 10 | 10 | 10 | 25 | 5 | 10 | 10 | 5 | 15 |
| द्वितीय पत्रका एकाई | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| प्रश्न संख्या | 2 | 2 | 2 | 2 | 2 | - | - | - | - |

- द्वितीय पत्रको विषयगत प्रश्नहरूको स्वरूप निम्नानुसार हुन सक्नेछ :
 - ५.१ लामो उत्तर दिने १० अङ्कका पूरा प्रश्नहरू सोध्न सकिनेछ ।
 - ५.२ एउटै प्रश्नलाई दुई वा दुई भन्दा बढी भागमा (Two or more parts of a single question) विभाजन गरी सोध्न सकिनेछ ।
 - ५.३ एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरू (Short notes) सोध्न सकिने छ ।
- प्रथम पत्रमा वस्तुगत बहुउत्तर (Multiple Choice) प्रश्नहरूको उत्तर सही दिएमा प्रत्येक सही उत्तर बापत १ (एक) अङ्क प्रदान गरिनेछ भने गलत उत्तर दिएमा प्रत्येक गलत उत्तर बापत २० प्रतिशत अर्थात् ०.२ अङ्क कट्टा गरिनेछ । तर उत्तर नदिएमा त्यस बापत अङ्क दिइने छैन र अङ्क कट्टा पनि गरिने छैन ।
- यस पाठ्यक्रममा जेसुकै लेखिएको भएता पनि पाठ्यक्रममा परेका ऐन, नियमहरू परीक्षाको मिति भन्दा ३ (तीन) महिना अगाडि (संशोधन भएका वा संशोधन भई हटाइएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा रहेको सम्झनु पर्दछ ।
- प्रथम चरणको लिखित परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरणको अन्तर्वार्तामा सम्मिलित गराइनेछ ।
- यस भन्दा अगाडि लागू भएका माथि उल्लिखित समूहको पाठ्यक्रम खारेज गरिएको छ ।
- पाठ्यक्रम लागू मिति :- २०६३/२ / २५ देखि

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प्रथम पत्र :- माइनिङ्ग इञ्जिनियरिङ्ग

- 1. Mining Geology** **10 %**
 - 1.1 Mineral, Rocks and Ore
 - 1.2 Definition of geological terminology
 - 1.3 Mineral Exploration: Purpose and management; Exploration techniques; Exploration stages; Exploration decision criteria;; Exploration drilling; Sample handling and preparation; Computer applications in exploration; Estimation of reserves and grade
 - 1.4 Mining and geological characteristics of deposits
 - 1.5 Geo-Statistics
- 2. Mine Surveying** **10 %**
 - 2.1 Fundamental definitions and concepts – Principles of survey, units of measurements, scales, Linear Measurements
 - 2.2 Surveying methods: Chain surveying, Traverse Surveying, Leveling, Plain Table Surveying, Contouring and Topographic surveying, Tachometric surveying, Trigonometrical leveling, Underground mine surveys, Triangulation
 - 2.3 Surveying Instruments: The Compass, Level, The Theodolite, Electronic Theodolites and Tachometers
 - 2.4 Accuracy and errors in Survey
 - 2.5 Mine Surveying and computer application in mining
- 3. Mine Development** **10 %**
 - 3.1 Definition of mining terminology in exploration and exploitation
 - 3.2 Access to mineral deposits, selection of opening methods
 - 3.2.1 Surface Mining development, Physical Environment and effects, Specific Hazards and controls
 - 3.2.2 Underground Mine Development: Shaft sinking, Tunneling, Inclines, Drifting and Raising
 - 3.3 Mine Development tools, machineries and equipments
 - 3.4 Drilling and blasting operation in mine development
 - 3.5 Safety consideration in mine development
- 4. Mining Methods, Mining Machinery and Transportation** **25 %**
 - 4.1 Selecting a mining methods / systems
 - 4.2 Open-cast mining methods: Placer / Alluvial mining, Open pit
 - 4.3 Underground mining methods: Room and Pillar methods, Long hole mining, Long wall mining systems, Hydraulic mining systems, Open stopes, Shrinkage stoping, Sublevel stoping, Minor stoping systems, Block caving, Sublevel caving, Cut and Fill stopes, Horizon mining and combined mining methods
 - 4.4 Stowing Practices
 - 4.5 Manual mining versus mechanized mining
 - 4.6 Mine planning and management
 - 4.7 Environment Management Plan
 - 4.8 Mining Machineries in surface and underground mine
 - 4.8.1 Excavation / face machineries
 - 4.8.2 Loading machines
 - 4.8.3 Transportation machineries: Face Transport, Haulage Surface and underground, Economic Analysis of Transportation System
 - 4.9 Mine Pumps

| | | |
|-----------|---|-------------|
| 4.10 | Hoist and Hoisting systems: Mine Hoist types, Hoist selection by usage, Technical consideration in selecting a hoisting system, Hoist accessories, Safety devices | |
| 4.11 | Safety and productivity | |
| 5. | Drilling and blasting | 5 % |
| 5.1 | Principles of drilling | |
| 5.2 | Drilling and blasting planning | |
| 5.3 | Drilling machines and accessories - surface, underground | |
| 5.4 | Drilling Patterns | |
| 5.5 | Drilling costs – surface and underground | |
| 5.6 | Explosive, Detonators and Accessories | |
| 5.7 | Transportation and storage of explosive | |
| 5.8 | Charging and blasting practice in surface and underground mining | |
| 5.9 | Ground and air vibrations from blasting | |
| 5.10 | Controlled blasting techniques | |
| 5.11 | Safety measures in drilling and blasting | |
| 5.12 | Chemical Fragmentation | |
| 6. | Mine Environment and Safety | 10 % |
| 6.1 | Mine atmospheres and gases | |
| 6.2 | Underground Environment and Mine Ventilation systems | |
| 6.3 | Mine Lighting | |
| 6.4 | Mine Hazards: Mine fires, gas, explosions, inundation | |
| 6.5 | Rescue and recovery operations | |
| 6.6 | Miners' diseases – fires, gas, explosions, inundations | |
| 6.7 | Surface and Underground Coal mine safety and health | |
| 6.8 | Surface and Underground Metal / non-metal mine safety and health | |
| 7. | Rock Mechanics | 10 % |
| 7.1 | Definitions – rock mechanics and rock | |
| 7.2 | Identification and Classification of Rocks | |
| 7.3 | Mechanical Properties and behavior of rock | |
| 7.4 | Strength and mechanics of fractures | |
| 7.5 | Stress in rock | |
| 7.6 | Design and stability of excavation – surface and subsurface roof and ground control | |
| 7.7 | Design and System of Mine Support | |
| 7.8 | Instrumentation and Experimental Techniques | |
| 8. | Mine Economics | 5 % |
| 8.1 | Concept of Mine Economics | |
| 8.2 | Conservation in mining | |
| 8.3 | Mine Valuation | |
| 8.4 | Mining costs and controls | |
| 8.5 | Cost Benefit Analysis (Economic Analysis) tools | |
| 8.6 | Market Survey | |
| 9. | Miscellaneous | 15 % |
| 9.1 | Mineral Processing | |
| 9.1.1 | Terminology | |
| 9.1.2 | Techniques: Crushing, Grinding, Sizing, Classification, Concentration, Miscellaneous Processes, Flow sheets of mineral processes | |
| 9.2 | Quality control in mining | |
| 9.3 | Site services in mining (workshop, colony etc.) | |
| 9.4 | General Geology of Nepal | |
| 9.5 | Mineral Prospect of Nepal | |
| 9.6 | Current Status of exploration and mining industry in Nepal | |

वस्तुगत बहुउत्तर नमूना प्रश्नहरू (Sample questions)

1. While testing the hardness of a mineral 'window glass' is used as a substitute for –
A) Gypsum B) Apatite C) Quartz D) Topaz

Correct Ans. (B)

2. Widely distributed non-metallic mineral in Nepal –
A) Gypsum B) Limestone C) Asphalt D) Asbestos

Correct Ans. (B)

3. The nearest tonnage of limestone required to produce 400 tpd of cement –
A) 400 B) 600 C) 1040 D) 350

Correct Ans. (B)

4. A fracture or break in the rock along which there has been appreciable movement is termed as –
A) Foliation B) Bedding plane C) Fault D) Cleavage

Correct Ans. (C)

5. What is the tool employed for breaking of rock in hydraulic mining?
A) Shearer B) Plough C) TBM D) Water

Correct Ans. (D)

6. Sinking of the surface due to underground mining operation is called –
A) Subsidence B) Thawing C) Stowing D) Bursting

Correct Ans. (A)

7. If the observed fore-bearing of a line AB is $12^{\circ} 24'$, its back bearing will be –
A) $102^{\circ} 24'$ B) $192^{\circ} 24'$ C) $348^{\circ} 36'$ D) $167^{\circ} 36'$

Correct Ans. (B)

8. A close contour line with one or more lower one inside indicates –
A) Hill B) Peak C) Flat D) Pond

Correct Ans. (D)

9. Which among these accidents that occur in an underground mine does never occur in an open cast mine?
A) Inundation B) Side fall C) Roof fall D) Fire

Correct Ans. (C)