TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2083 Baishakh

Exam.	Back (New Course)		
Level	BE	Full Marks	30
Programme	BCE	Pass Marks	12
Year / Part	I / II	Time	1½ hrs.

Subject: - Engineering Geology II *(ENCE 152)*

- ✓ *Candidates are required to give their answers in their own words as far as practicable.*
- ✓ *Attempt **All** questions.*
- ✓ *The figures in the margin indicate **Full Marks**.*
- ✓ *Assume suitable data if necessary.*

1. Define aquifer. Differentiate between confined and unconfined aquifer. [1+2]
2. Describe Hoek-Brown failure criterion. Discuss the importance of mechanical properties of rock in civil engineering. [2+2]
3. Write down the importance of discontinuities characters that affect rock mass classification. Discuss the tunnel excavation methods and support system in rock mass class IV based on Rock Mass Rating (RMR) classification. [2+2]
4. Define earthquake. How do you calculate earthquake magnitude (Richter Scale)? [2+2]
5. What are the major engineering geological investigations carried out for the dam construction? Discuss the importance of core drilling for sub-surface geological investigation. [3+3]
6. Discuss the stability analysis based on the following information [4]
   Hill slope: $120^0/38^0$
   Joint set 1: $270^0/42^0$
   Joint set 2: $140^0/56^0$
   Friction angle: 28^0
7. Write short notes (Any Two): [5]
   a) Seismic Refraction Tomography (SRT)
   b) Elastic Modulus
   c) Landslide Dam Outburst Flood (LDOF)

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TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2082 Bhadra

Exam.	Regular (New Course)		
Level	BE	Full Marks	30
Programme	BCE	Pass Marks	12
Year / Part	I / II	Time	1½ hrs.

Subject: - Engineering Geology II *(ENCE 152)*

- ✓ *Candidates are required to give their answers in their own words as far as practicable.*
- ✓ *Attempt **All** questions.*
- ✓ *The figures in the margin indicate **Full Marks**.*
- ✓ ***Provide stereonet, tracing paper and graph paper where necessary.***
- ✓ *Assume suitable data if necessary.*

1. Discuss on the factors affecting ground water movement in the Nepal Himalaya. [2]
2. Define rock stress and describe various in-situ measurement methods of rock stress. [1+3]
3. Discuss the Rock Mass System (RMR) and Q-system for rock mass classification. [2+2]
4. Define hazard, vulnerability and risk. Write down the importance of landslide with its neat diagram. [1+3]
5. What is site investigation? Discuss the importance of Electrical Resistivity Tomography (ERT)and Multichannel Analysis of Surface Waves (MASW) in site investigation. [2+4]
6. Discuss the stability analysis based on the following information. [5]
   Hill slope: $160^0/40^0$
   Joint set 1: $340^0/50^0$
   Joint set 2: $330^0/60^0$
   Friction angle: 30^0
7. Write short notes (Any Two): [5]
   a) Glacial Lake Outburst Flood (GLOF)
   b) Schmidt hammer test
   c) Synthetic-aperture radar (SAR)

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TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2081 Ashwin

Exam.	Regular (New Course-2080 Batch)		
Level	BE	Full Marks	30
Programme	BCE	Pass Marks	12
Year / Part	I / II	Time	1½ hrs.

Subject: - Engineering Geology II *(CE 152)*

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ *Attempt **All** questions.*
- ✓ *The figures in the margin indicate **Full Marks**.*
- ✓ ***Necessary chart is attached herewith.***
- ✓ *Assume suitable data if necessary.*

1. Explain different techniques for artificial recharge of groundwater in the context of Kathmandu valley. [2]
2. Describe the mechanical properties of rocks. [4]
3. What is Rock Mass? Describe Rock Mass Rating (RMR) classification. [1+3]
4. What are the major hazards in the context of Nepal? Differentiate between magnitude and intensity of the earthquake. [5]
5. a) Describe the sub-surface investigation phase of an engineering geological site investigation. [5]

   b) Three boreholes are sunk at SW, SE, and NW corners of square level ground. The side of the square is 1500 m long. The boreholes are A, B, C respectively. The boreholes meet the coal seam at 150 m in A, 450 m in B, and 600 m in C. [5]

   (i) Determine the attitude of the coal seam.
   (ii) Fourth borehole is proposed at D, the NE corner of the square land. Calculate at what depth, the borehole encounters the coal seam.
   (iii) Find out the true thickness of coal seam if its apparent thickness is found to be 50m.
6. A hill slope with the orientation N40°W/55° has outcrop of Phyllite Rock containing discontinuity orientation N51°W/37°. The friction angle of plane of discontinuity is 28°. Design a cut slope for stable road with the possible mode of failure by using Sterographic Projection Method. [5]

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