

05 K TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2075 Bhadra

Exam.	Regular		
Level	BE	Full Marks	80
Programme	BCE	Pass Marks	32
Year / Part	IV / II	Time	3 hrs.

Subject: - Rock Mechanics (Elective II) (CE76511)

- ✓ 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 figures are attached herewith.
- ✓ Assume suitable data if necessary.



1. Why rock mechanics is important for the civil engineer? Explain with the suitable examples. [4]
2. List the index properties of Rocks. Explain any two with their significance to civil engineering. [6]
3. List the different stress failure criteria. Describe about the Mohr-Coulomb failure criteria in rocks. [8]
4. What are the techniques for the measurements of in-situ stresses? Explain about stress direction. [8]
5. Describe about planes of weaknesses in rock. What are the important effects of water pressure? [6]
6. Explain about the elastic and non-elastic behavior of rocks. How can you measure the deformability of rock? List the measurement techniques and describe briefly. [10]
7. What are the modes of failure in hard rocks? How can you make analysis easier and explain the methods of analysis. [8]
8. Describe about the wedge failure with the help of stereographic projection. Show the systematic sketches to analyze the wedge failure with usual notations. [8]
9. How can you analyze the slides of composed of two blocks? [4]
10. What are the failures criteria describe by Hoek-Brown? What are the effects of strength related to size? [6]
11. Find the types of failure. Give your analysis with the help of following data. $\gamma_r = 26 \text{ KN/m}^3$, $\gamma_w = 10 \text{ kN/m}^3$; Total Height of the wedge, $H = 30 \text{ m}$ [12]

Plane	Dip	Dip Direction	Shear Parameters
1	65	350	$\Phi = 30$ and $c = 50 \text{ kPa}$
2	55	130	
Slope Face	75	60	
Upper Surface	15	70	
