

B. Tech 8th Semester Examination

Rock Mechanics (NS)

CE-421(a)

Time : 3 Hours

Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions selecting one question from each section A, B, C and D. Question 9 is compulsory. All questions carry equal marks. Non-programmable calculator is allowed.

SECTION - A

1. Explain with suitable illustrations the utilization of the concepts of rock mechanics in civil construction projects. (20)

OR

2. Discuss Barton's Q-system of rock mass classification in detail giving suitable examples. (20)

SECTION - B

3. (a) Explain various types of stresses in rock illustrating stress anisotropy and stress ratio. (10)

- (b) Discuss how will you determine the compressive strength of a rock specimen in the laboratory. (10)

OR

4. Illustrate the uniaxial test in a tunnel in detail explaining with neat diagrams its applications. (20)

SECTION - C

5. Discuss back analysis method of determining the stability of a rock slope giving neat sketches and example. (20)

OR

6. Explain the hydro-fracturing technique in detail with suitable illustrations. Specify the utility of this technique in the field. (20)

SECTION - D

7. Discuss rock pressure theories in detail giving suitable diagrams. Also give their relative advantages and disadvantages. (20)

OR

8. Explain various methods of pressure grouting in tunnels with illustrative sketches and specific uses of each method. (20)

SECTION - E (Compulsory)

- 9 (a) Explain the relationship of rock mechanics with engineering geology.
(b) What is lithology? Explain.
(c) Discuss effect of saturation on strength of rock.
(d) What is the effect of rate of testing on strength of rock?
(e) Briefly explain modes of failure of rock slope.
(f) What is over-coring?
(g) What is tunnel lining? Explain.
(h) Explain dental concreting.
(i) What is the effect of specimen size on strength of rock?
(j) Give stress distribution in rock. (10×2=20)