CBCS SCHEME

USN ☐☐✱☐☐☐☐☐☐☐

15MN64

Sixth Semester B.E. Degree Examination, Aug./Sept.2020
Rock Mechanics

Time: 3 hrs.

Max. Marks: 80

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Define Rock Mechanics and explain in detail the scope of it. **(08 Marks)**
  b. Explain in detail the Barton's shear strength of joints. **(08 Marks)**

OR

2 a. Explain the problems to be solved associated with rock mechanics study. **(08 Marks)**
  b. Explain in detail how folds effect the tunneling construction. **(08 Marks)**

Module-2

3 a. Define the following :
    i) Normal stress ii) Young's modulus iii) Poisson's ratio. **(06 Marks)**
  b. Determine the resultant stress acting in a two dimensional stress system shown in Fig.Q3(b) below :
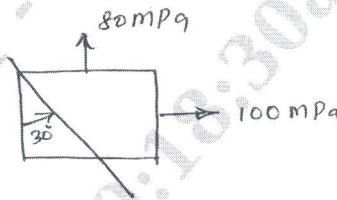

Fig.Q3(b) **(10 Marks)**

OR

4 a. Explain with an example the plane strain problem. **(06 Marks)**
  b. Derive with usual notations the compatibility equations. **(10 Marks)**

Module-3

5 a. Explain the engineering importance of porosity and permeability of rocks. **(08 Marks)**
  b. Write short notes on :
    i) Electrical properties of rocks ii) Thermal properties of rocks. **(08 Marks)**

OR

6 a. Describe the method of determination of 'RQD' and explain its importance. **(08 Marks)**
  b. Explain in detail the creep phenomenon, with a neat sketch. **(08 Marks)**

Module-4

7 a. Name the different types of insitu tests conducted to determine deformability of rock mass and explain the necessity of insitu tests. **(08 Marks)**
  b. Explain with a neat sketch, the method of determination of shear strength of rock mass using Single Jack Test. **(08 Marks)**

OR

8 a. Explain in detail the Coulomb's criteria of rock failure. (06 Marks)
   b. Explain in detail the Mohr's criteria of rock failure. (10 Marks)

Module-5

9 a. Differentiate between Hookean and Newtonian Rheological Models. (06 Marks)
   b. Explain in detail Kelvin Model. (10 Marks)

OR

10 a. Explain in detail the determination of elastic constant by Static Method. (08 Marks)
   b. Explain in detail the determination of elastic constant by Dynamic Method. (08 Marks)

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