USN | | | | | | | | | | **18MN731**

Time: 3 hrs.   Max. Marks: 100

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

Module-1

1 a. What is the role of slope angle on opencast mining economics? **(10 Marks)**
  b. Explain about plane failure and circular failure in slopes with neat sketches. **(10 Marks)**

OR

2 a. What are the factors affecting on slope stability and explain wedge failure with neat sketch. **(10 Marks)**
  b. What are the causes for slope failure and explain toppling failure with neat sketch. **(10 Marks)**

Module-2

3 a. What are geotechnical data required for high wall slope stability? **(10 Marks)**
  b. What are geological factors affects on slope stability? **(10 Marks)**

OR

4 a. Explain any one slope stability study of high walls at open cast mines. **(10 Marks)**
  b. Explain scope, applicability and advantages of slope stability study. **(10 Marks)**

Module-3

5 Define shear strength of rock. Determine shear strength of intact rock by direct shear test with neat sketches. **(20 Marks)**

OR

6 a. Define joint roughness coefficient and how does the roughness influence on shear strength of rock. **(10 Marks)**
  b. Write short note on Barton's shear strength of rock. Calculate shear strength of rock for following data:
  Normal stress = 20 MPa
  Friction angle = 30°
  Joint roughness coefficient = 14
  Joint compressive strength = 26 MPa. **(10 Marks)**

Module-4

7 a. Define Permeability. How permeability affect on the stability of slope? **(10 Marks)**
  b. Describe the concept of water flow through soil type material and broken spoil material. **(10 Marks)**

OR

8 a. Explain estimation with measurement of permeability and water pressure of rock mass.

(10 Marks)

b. Describe the Seepage forces and Seepage patterns under various conditions. **(10 Marks)**

Module-5

9 a. Explain briefly about limit equilibrium method for stability analysis for bench slopes.

(10 Marks)

b. Describe various stabilization techniques for slope stability. **(10 Marks)**

OR

10 a. Explain briefly the Probabilistic approaches of slope analysis. **(10 Marks)**

b. Explain briefly about numerical modeling method of slope analysis. **(10 Marks)**

* * * * *