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18MN61

## Sixth Semester B.E. Degree Examination, July/August 2022 Ground Control

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. Discuss about Ground Control, purpose and types of excavations in underground mines. (10 Marks)  
b. Discuss the various methods for design and stability of underground excavation. (10 Marks)

OR

- 2 a. Explain Discrete Element Method with neat sketch. (10 Marks)  
b. A circular tunnel entry 5m diameter is situated in a coal field. Design the tunnel for the following : Compressive strength = 40MPa ; Tensile strength = 5.0 MPa  
Poisson's ratio = 0.20 ; Compressive stress factor = 4.0 ; Tensile stress factor = 0.2  
Depth of tunnel/overburden = 200 ; Density of overburden = 15.5 kN/m<sup>3</sup>. (10 Marks)

### Module-2

- 3 a. List the factors to be considered for designing a pillar and explain each. (10 Marks)  
b. With neat labeled sketch, explain the foundation failure mode for pillar design. (10 Marks)

OR

- 4 a. With neat labeled sketch, explain the stress distribution within the pillar. (10 Marks)  
b. With neat sketch, discuss about the yield pillar approach. (10 Marks)

### Module-3

- 5 a. Discuss in detail the various impacts of subsidence on surface and in underground activities. (10 Marks)  
b. With neat sketch, discuss the continuous type of subsidence. (10 Marks)

OR

- 6 Interpret the various methods for Controlling and preventing in Mine Subsidence, with neat sketches. (20 Marks)

### Module-4

- 7 a. With neat sketch, explain the Mechanism of Caving. (10 Marks)  
b. Discuss the various factors affecting the Cavability. (10 Marks)

OR

- 8 a. Interpret about the various causes of Coal bump. (10 Marks)  
b. Discuss the various methods for prevention and controlling of coal bump. (10 Marks)

### Module-5

- 9 a. Explain the various steps involved in rock mass classification. (10 Marks)  
b. Discuss about Rock quality designation and its limitations. (10 Marks)

OR

- 10 a. Discuss the applications of Rockmass classification in Rock Engineering. (10 Marks)  
b. Explain about the recommendations of Paul Commission report on monitoring and measurement of Support System. (10 Marks)

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