



CBCS SCHEME

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18MN61

Sixth Semester B.E. Degree Examination, Jan./Feb. 2023

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. Explain the stress concentration around a single opening in an axial stress condition and describe the effect of confining pressure around the opening when $M = 0, 1, \frac{1}{3}$. (10 Marks)
- b. A circular opening of diameter 5m is at a depth of 250m from the surface. The overburden pressure 20kn/m^3 for a stress ratio is one, determine the magnitude of the following stresses along its boundary. (10 Marks)

OR

- 2 a. Explain the importance of numerical modeling (BEM, FEM and FDM) in underground structure. (10 Marks)
- b. Explain the design constraints due to an underground excavation. (10 Marks)

Module-2

- 3 a. Explain the effect stress ground the pillar in an underground mine. (10 Marks)
- b. Explain effect of roof floor and depth on pillar strength. (10 Marks)

OR

- 4 a. Explain the design process of yield and barrier pillar. (10 Marks)
- b. Interpret the methodologies to assess the panel stability. (10 Marks)

Module-3

- 5 a. Explain the preventive measures against subsidence. (10 Marks)
- b. Explain the use of influence function to determine the subsistence. (10 Marks)

OR

- 6 a. Explain the use of profile function to determine the subsidence. (10 Marks)
- b. Explain the damages caused due to the subsidence. (10 Marks)

Module-4

- 7 a. Explain the factors affecting the coal bumps. (10 Marks)
- b. Explain the pressure arch memory approach of rock caving. (10 Marks)

OR

- 8 a. Summarize the factors affecting the capability in an underground. (10 Marks)
b. Explain the mechanism of occurrence of coal bump. (10 Marks)

Module-5

- 9 a. Classify the rock mass based on Terzaghi rock classification and suggest the support system based on the same. (10 Marks)
b. Classify the rock mass based on RMR (Rock Mass Rating) rock classification and suggest the support system based on the same. (10 Marks)

OR

- 10 a. Classify the rock mass based on Rock structure rating and suggest the support system based on the same. (10 Marks)
b. Classify the rock mass based on Q-system and suggest the support system based on the same. (10 Marks)
