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10MN72

**Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020**  
**Ground Control**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.**

**PART – A**

- 1 a. Discuss the influence of water, time, confining pressure, creep and temperature on rock behavior and its strength parameter. (10 Marks)  
b. Describe the constraints on Ground control design in case of Bord and Pillar and long wall mining. (10 Marks)
- 2 a. Illustrate the use of profile and influencing function to determine surface subsidence. (10 Marks)  
b. Describe the trough subsidence over a long wall panel with a neat sketch and explain the factors affecting the same. (10 Marks)
- 3 a. With a neat sketch, explain Dowel reinforcement. (10 Marks)  
b. Explain the process of cemented sand fill and rock fill. (10 Marks)
- 4 a. Describe the sources and estimate the insitu stress for an underground excavation. (10 Marks)  
b. Draw and explain the stress concentration around a single opening (circular) in a uniaxial stress condition if the vertical stress is zero and horizontal stress is maximum what happens if confining pressure around the opening is equal to 0, 1 and 1/3. (10 Marks)

**PART – B**

- 5 a. Explain Rock Mass Rating and how to use the RMR to supporting the underground structure, with an example. (10 Marks)  
b. Explain Rock Structure Rating and how to use the RSR for supporting the underground structure with an example. (10 Marks)
- 6 a. Explain the theories of roof bolting. (10 Marks)  
b. Draw the installation patterns of roof bolt in underground. (10 Marks)
- 7 a. Explain the load measuring devices used in measurement of insitu stresses of a underground structure. (10 Marks)  
b. Explain the stress measuring devices used in underground. (10 Marks)
- 8 a. Explain the different mechanism of Coal bump. (10 Marks)  
b. Explain causes and occurrence of Rock burst/Coal bump. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.