VIth Semester Examination 2013
Mining Engineering
MN 601: Rock Mechanics Applications

Full marks: 70   Time: 3 hours

1st Half

Answer question number 1 and any two from the rest

1. Write short notes on: a) Direct Toppling failure b) Overcoring c) Tilt in subsidence d) Anderson stress classification   (4+4+3+4)

2. What are the conditions under which a planar failure may occur? Derive the expression for finding out the slope factor of safety when a discontinuity surface is exposed on the face and intercepted by a dry vertical tension crack.   (2+8)

3. Derive the expression for calculating factor of safety in wedge failure and prove that it increases with sharpness and verticality of the wedge.   (5+5)

4. Draw subsidence profiles to indicate angle of draw, subsidence, curvature, and tilt. What do you mean by critical and supercritical width?   (6+4)

B.E. End Semester Examinations, 2013

(6th Semester Mining Engineering)

Session: 2012-2013

Subject: **Rock Mechanics Applications**   Subject Code: **MN 601**

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2ⁿᵈ 1ˢᵗ **Half**

Answer Question No. 6 and any two from the rests.

6. a) A coal mine is being mined at 500 ft with stable pillar and roofs, and mining is planned at 1000 ft. What square pillar should be selected at that depth? Given that h= 12 ft, w=40ft and B=16 ft.

   b) What are the different types of pillar failure?   (10+3)

7. a) Write down the guidelines for choosing the specifications of mechanical bolts.

   b) Enumerate the procedure for support selection.   (8+3)

8. a) Write down the reasons for monitoring the mining structures.

   b) Write short note on the followings:

      i.   Borehole deformation gauge

      ii. Convergence meter   (3+4+4)

9. Assess the floor stability in a coal mine entry under the following conditions: Longwall panel at the depth of 600 ft. The floor of the 18 ft wide entry is next to a yield pillar with B=20 ft and L=130 ft. Entry height, h= 8 ft. The properties of the fractured shale, which is the floor material, are: γ=70 lb/ft^3, cohesion, c= 30 psi, friction angle φ=25^0. Uniaxial compressive strength, σ_c=1700 psi. The rock mass rating, RMR=45   (11)

10. a) What are the different types off coal bumps?

    b) Write down the remedial measures of coal bumps.

    c) Write down causative factors of rock bursts.   (2+5+4)