B. E.3rd Semester Mining Engineering Examination, December, 2011
Mine Development (MN-302)

Full Marks: 70   Time: 3 hours

FIRST HALF

Answer questions No 1 and any two from the rest in the first half.

Figures on the right-hand side margin indicate full marks

1. a) Write the regulation 66 of The Coal Mines Regulation 1957 related to Outlets from a mine.
    b) Write the four Advantages and two disadvantages of incline over the shaft.
    c) Explain i) Walling scaffold with a diagram.

                                                                 5 + 6+ 4 =15

2. a) Explain four factors to be considered for selecting site of an incline or shaft.
    b) What is shaft pillar?
    c) Name surface equipment required for shafting.

                                                                 4+ 1+5 =10

3. a) Explain : temporary lining in shaft sinking.
    b) Explain : Water garland curb

                                                                 6+4=10

4. a) What are different classes of Caisson methods of shaft sinking?
    b) Explain piling method of shafting with a suitable sketch.
                                                                 2+8=10

5. a) Explain Rider used in shaft sinking with a diagram.
    b) Explain drilling and blasting pattern in shaft sinking with suitable diagram.
                                                                 5+5 = 10

Answer question no. 6 and any two questions from the rest
All parts of a question should be answered at one place

6. a) An Incline gradient 1 in 4.8 touches a coal seam at 1060m. The working faces are 48 pillars away from Incline along the main dip of the seam. The size of the pillar is 45m×45m (centre to centre) and dip of the seam is 1 in 15. Mine management decided the extraction of pillars with stowing for protection of surface structure. Suggest proper layout of stowing ranges.

   b) What is ring-main system?

   (10+3)

7. a) Draw the diagram of a safari support and describe.

   b) Describe with proper sketch the difference between frame support and chock support.

   (5+6)

8. A retreat longwall panel is to be developed in a coal seam at depth of 380 m from surface and 3.8 m thick by Road Header. The immediate roof above coal seam is made of shale, sandy shale and medium grain sandstone. The thickness and RMR of the immediate strata is given below

Types of strata	Thickness (m)	RMR
Coal	3.8	44
Shale	0.3	38
Sandy shale	0.6	56
Medium grain Sandstone	0.8	80

Calculate final RMR for designing SSR for development of the longwall panel.

   (11)

9 a) Write short notes on the followings

   i. Positive-set valve
   ii. Linear control valve

   b) Describe the working principle friction prop.

   (3×2+5)

10 a) "Roof bolting should be the sole means of support in a mechanized development districts". justify it.

   b) Describe the advantages and disadvantages of sandstone roof.

   (6+5)