

B.E. 3rd Semester (Mining) Final Examination, 2013  
Bengal Engineering and Science University, Shibpur  
Mine Development (MN301)

F.M: 70

Time: 3 hrs.

Answer SIX questions taking three from each half

First Half

PART-A: Answer any two questions

1. A retreat longwall panel is to be developed in a coal seam (Thickness: 3.8 m and RMR: 44) at depth of 380 m by Road Header. The immediate roof above the coal seam are made of shale (Thickness: 0.3 m and RMR: 38), sandy shale (Thickness: 0.6 m and RMR: 56) and medium grain sandstone (Thickness: 0.8 m and RMR: 80). Design a suitable SSR for development of the longwall panel. [10]
2. a) What are the parameters considered to calculate of Rock Mass Rating (RMR) of coal bearing roof strata? Classify roof strata in coal mines as per Indian system of roof classification and describe its support requirements.  
b) What is ring-main system?. [3+4+3]
3. a) Write short notes on -
  - i) Rotary Control Valve
  - ii) Rapid Yield Valveb) Draw a neat sketch of shield support, label its components and describe the necessity of each component. [2+2+6]

PART-B: Answer any one question

4. a) Write the regulation 66 of The Coal Mines Regulation 1957 related to Outlets from a mine.  
b) Write the six advantages and two disadvantages of incline over the shaft.  
c) Explain : Walling scaffold with a diagram. [5 + 4+ 6 =15]
5. a) What is shaft pillar?  
b) Explain different thumb rules for calculating size of a shaft pillar for a circular shaft of a coal mine.  
c) Explain the factors to be considered for selecting site of an incline or pit. [2+8+5=15]

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**Second Half**

**Answer any three questions from second half.**

Half marks are kept for neatness.

6. Explain the (i) temporary lining, and (ii) Water garland curb in shaft sinking with all necessary sketches.

$$6\frac{1}{2} + 5 = 11\frac{1}{2}$$

7. a) What are the special methods of shaft sinking?  
b) Explain Piling method or Pneumatic caisson method of shaft sinking with suitable sketches.

$$2\frac{1}{2} + 9 = 11\frac{1}{2}$$

8. a) Give a brief idea about how target areas are delineated for undertaking costly detailed exploration.  
b) What are the types of exploratory openings created for generating subsurface information?

$$5 + 6\frac{1}{2} = 11\frac{1}{2}$$

9. a) What are the surface plant and equipment required for shaft sinking?  
b) Explain drilling and blasting in shaft sinking.

$$7 + 4\frac{1}{2} = 11\frac{1}{2}$$

10. i) Explain the followings:

- a) Incline
- b) Shaft
- c) Adit

- ii) Define the following terms with reference to coal mining: a) gallery, b) pillar, c) Crosscut d) drift, e) heading, f) face, g) district

$$4\frac{1}{2} + 7 = 11\frac{1}{2}$$