R. No.
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Max. Marks: 100

# B.E (F.T.) DEGREE END-SEMISTER EXAMINATIONS, April – May 2011 MINING ENGINEERING BRANCH

## Fifth Semester – (Regulations 2004)

MI 375 UNDERGROUND MINING METHODS (COAL)

Time: 3.00 hours

### Answer ALL Questions

## PART – A (10 X 2 = 20 Marks)

- 1. How is bituminous coal classified commercially?
- 2. In the present controversy of nuclear power, explain the importance of coal in Indian Power sector.
- 3. Explain the reasons for driving the so called level galleries slightly rising as they are driven away from the haulage roadway.
- Calculate the percentage of extraction of coal during double section development of pillars having, centre to centre, 25 (width) X 35 (length) X 2.75 (height) m in a seam of 9.5 m thickness. Assume if any data is missing.
- 5. Explain the reasons for the popularity of diagonal line of extraction in bord and pillar depillaring by caving.
- 6. State the conditions under which a bord and pillar panel can be extracted by mechanisation.
- 7. Explain the reasons for the growing popularity of longwall method of mining coal world over.
- 8. Explain the term "prop-free-front" and explain its merits and demerits.
- 9. Define the term 'bump'. State the precautions to be taken while extracting seams liable to bumps.
- 10. What additional precautions are to be taken while extracting steeply dipping coal seams?

#### PART – B (5 X 16 = 80 Marks)

- 11. Explain mechanised retreat longwall mining with the help of neat sketches. The answer should include different equipment proposed to be used along with brief specifications of each of it.
- 12. (a) Give a layout for a semi-mechanised bord and pillar development district in a coal seam 2.8 m thick and dipping at 1 in 5. The answer should include, size & shape of the pillars and galleries, support system proposed in galleries and junctions, machinery proposed with reasons for selecting the same, present & proposed position of the workings, haulage, ventilation & pumping layouts, manpower required and expected output and OMS. Assume missing data, if any.

OR

(b) Give the layout of a bord and pillar development district with continuous miners in a seam having 4.5 m thickness and 1 in 8 gradient. The answer should include, size of & shape of the pillars and galleries, horizon of development, support system proposed in galleries and junctions with reasons for selecting the same, other machinery proposed with justification for selecting the same, present & proposed position of the workings, haulage & ventilation layouts, manpower required and expected output and OMS. Assume missing data, if any.

13.

(a)

- (i) State the procedure to be followed to obtain permission for depillaring indicating the information to be furnished at the time of making the application for permission. (8 marks)
- (ii) Explain the preparatory arrangements to be made and other activities to be carried out after obtaining permission and before actually commencing the depillaring operations in a bord and pillar panel.

(8 marks)

### OR

- (b) (i) Explain a method of assessing the life of a bord and pillar depillaring district by caving. (10 Marks)
  - (ii) Define contiguous seams and state the precautions to be taken while extracting them. (6 marks)
- (a) Explain hydraulic mining method to extract coal seams. Also explain the conditions essential for adopting this method.

#### OR

- (b) Explain, in detail, inclined slicing method of mining of a 15 m thick coal seam in descending order.
- (a) Write short notes on **any TWO** of the following
  - (i) Factors influencing the size and shape of pillars in bord and pillar method of mining.
  - (ii) Systematic support rules for a bord and pillar depillaring district with caving in a 4.5 m thick seam developed along the floor of the seam.
  - (iii) Critical width method of partial extraction of coal.

#### OR

- (b) Write short notes on any TWO of the following
  - (i) Air blast.
  - (ii) Stowing method of extraction.
  - (iii) Underground gasification of coal.

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15.

14.