

# 22250

**22223**

**3 Hours / 70 Marks**

Seat No. 

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- Instructions* –
- (1) All Questions are *Compulsory*.
  - (2) Answer each next main Question on a new page.
  - (3) Illustrate your answers with neat sketches wherever necessary.
  - (4) Figures to the right indicate full marks.
  - (5) Assume suitable data, if necessary.
  - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
  - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

- 1. Attempt any FIVE of the following: **10****
- a) In coal seam of third degree gassiness, long wall mining is preferred over board and pillar method.' Give reason.
  - b) Define "Incubation Period" of coal seam.
  - c) Give classification of coal seam on the basis of coal Seam thickness.
  - d) Calculate the % extraction during development when 3 meter coal seam is developed to full height. The dimension of coal pillar from center to center is 26 meters  $\times$  26 meters and dimension of solid coal pillar after development is 21.8 meters  $\times$  21.8 meters. Calculate by area method.
  - e) List the factors affecting length of Long wall Gate roads.
  - f) List the advantages of Long wall double unit face over Long wall single unit face.
  - g) Define Angle of Draw in mine subsidence.

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- 2. Attempt any THREE of the following:** **12**
- a) Explain how following factors influence the choice of exploitation of Coal.
    - i) Depth of seam
    - ii) Geological faults and fold
  - b) State the advantages of board and pillar method.
  - c) Compare Close panel development system with open Panel System of development.
  - d) Sketch and explain different lines of Goaf or different lines extracting pillars while depillaring.
- 3. Attempt any THREE of the following:** **12**
- a) Define Contiguous seams and enlist precautions which are to be taken while working contiguous seam.
  - b) Compare “Cyclic Long wall with Non Cyclic Long wall” Method.
  - c) List the various advantages and disadvantages of Long wall mining Method.
  - d) List the various theories of subsidence. Explain any one of them by drawing a neat sketch.
- 4. Attempt any THREE of the following:** **12**
- a) Define with reference to caving
    - i) Local Fall
    - ii) Main fall
  - b) Describe the precautions to be taken while working below waterlogged area as per CMR2107.
  - c) Describe the precautions to be taken while working near restricted areas as per CMR2107.
  - d) Compare long wall mining using SERD with long wall mining using DERD.
  - e) Compare Long wall Advancing Face with long wall Retreating Face.

**5. Attempt any TWO of the following:****12**

- a) A coal seam is to be developed by using board and pillar method Under following conditions
- Seam thickness : 4.8 m
  - Height of gallery during development : 3 m
  - Width of gallery : 4.8 m
  - Dimension of pillar : 26 m × 26 m center to center
  - Incubation period : one year
  - Average out put during depillaring 250 tons per shift
  - Specific gravity of coal : 1.4

Calculate

- The percentage of extraction during depillaring
  - Number of pillars in a close panel
- b) A coal seam of 5 meter thickness is to be developed by using LHD and Chain conveyer combination. Suggest a suitable layout and calculate manpower and OMS. Assume your own conditions.
- c) Explain the who frames the strata control and Monitoring Plan. List the key guidelines of strata control and monitory plan regarding.
- Maximum Distance between two supports in same row
  - Maximum Distance between two rows
  - Minimum area to be supported by using strata control plan

**6. Attempt any TWO of the following:****12**

- a) A coal seam of 5 m thickness is to be developed by using DERD (Double Ended Ranging Drum Shearer). Expected output per shift is 1200 tones. Suggest a suitable layout and Manpower requirement and calculate OMS (Overall output per Man per shift). Assume your own conditions.
- b) Explain the various advantages and disadvantages of sand stowing over caving.
- c) Explain how by using survey we can measure the surface subsidence
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