

22250

24225

3 Hours / 70 Marks

Seat No.

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- Instructions –*
- (1) All Questions are *Compulsory*.
  - (2) Figures to the right indicate full marks.
  - (3) Assume suitable data, if necessary.
  - (4) 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) Define open panel and closed panel system of working.
  - b) Define stripping Ratio.
  - c) Define contiguous Seam.
  - d) Define spitting and slicing.
  - e) Enlist the advantages of sand stowing.
  - f) State any four factors affecting length of longwall face.
  - g) Define the term subsidence and subsidence factor.
2. **Attempt any THREE of the following.** **12**
- a) Explain the conditions under which strike development is preferred over Dip development.
  - b) Explain advantages and disadvantages of Board and Pillar method.
  - c) Explain the preparatory arrangement to be made before starting depillaring.
  - d) Explain the various precautions to be taken to avoid Air Blast during caving operation of depillaring.

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- 3. Attempt any THREE of the following** **12**
- a) State the precautions to be taken while working below waterlogged area.
  - b) Differentiate between cyclic longwall mining and Non- cyclic longwall mining.
  - c) Explain Longwall advancing and longwall Retreating methods of mining.
  - d) Describe the Dome theory of Subsidence.
- 4. Attempt any THREE of the following.** **12**
- a) Explain -
    - i) Local fall
    - ii) Main fall
    - iii) Cavability Index
    - iv) H/L Ratio.
  - b) Write the precautions to be taken while working below depillared Goaf as per CMR 2017.
  - c) State the precautions to be taken while working contiguous seam development working.
  - d) Differentiate between SERD and DERD.
  - e) Compare longwall single unit face with longwall Double unit 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 -
    - i) Seam Thickness - 5.2 m
    - ii) Height of Gallery during development - 3.5m
    - iii) Width of Gallery - 5.2 m.
    - iv) Dimensions of Pillar - 26m × 26m center to center.
    - v) Incubation period - 12 months

- vi) Specific gravity of coal - 1.4
- vii) Average output during depillaring - 275 tonnes per shift.
- viii) Working days in month - 26 days.
- ix) % recovery of pillar extraction - 85% Calculate :-
  - 1) The percentage of extraction during depillaring.
  - 2) Number of pillars in a closed panel.
- b) A coal seam at a depth of 600m is 1.5 m thick dipping at 1 in 5. The longwall face is 150 m and it is advanced 2 m per day. The density of coal is 1.4 and incubation period of coal is 10 months. Find the production and face length of longwall advancing layout if recovery of coal is 75%
- c) Explain Hydraulic stowing in detail and state its advantages.

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

**12**

- a) State the different factors affects the Subsidence. Also describe the precautions to be taken for reducing subsidence.
  - b) A coal seam of 4.8 m thickness is to be developed by using DERD. Expected output per shift is 1000 tones. Suggest a suitable layout and manpower requirement and calculate OMS. Assume your own conditions.
  - c) Describe the advantages and disadvantages of Longwall caving method.
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