USN | | | | | | | | | | **18MN641**

Sixth Semester B.E. Degree Examination, Jan./Feb. 2023
Underground Mine Planning and Design

Time: 3 hrs.   Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1   a.   Summarize the social and economic impacts due to mining activities.   **(10 Marks)**
    b.   List out the Mine Laws influencing the mining industries in India.   **(10 Marks)**

OR

2   a.   Summarize the environmental impacts due to underground mining activities.   **(08 Marks)**
    b.   Mention the factors to be considered during selection of optimum plant site locations for constructions.   **(12 Marks)**

Module-2

3   a.   Summarize in brief, the three stages involved during mine planning study.   **(12 Marks)**
    b.   Mention the factors affecting the division of coal field into mining areas.   **(08 Marks)**

OR

4   a.   Summarize the details to be furnished during preparation of Detailed Project Report (DPR) of underground coal mine projects.   **(12 Marks)**
    b.   With a neat sketch, explain pit bottom layout for men and material winding in underground coal mines.   **(08 Marks)**

Module-3

5   a.   Determined the inclined length of the level and number of levels can be developed in a mining area, for the given conditions :
- Daily coal output of the mine is 1500 tons.
- Annual rate of face advance 400 m.
- Life of the mine is 35 years.
- The gradient of the seam is 15°
- Weight of 1 cm of the coal seam is 1.3 t/m^3
- Thickness of the seam is 1.5 m and
- Co-efficient of recovery of the coal is 0.88.   **(12 Marks)**

    b.   Explain in details the division of mining property into level divisions.   **(08 Marks)**

OR

6   a.   Summarize the parameters to be considered to determine length of the longwall face and number of longwall faces to achieve planned output.   **(12 Marks)**
    b.   Explain in details the division of mining property into panel divisions.   **(08 Marks)**

Module-4

7 Determine the break-even cut off grade for a copper mine assuming the following data :
- Mill recovery = 90%
- Mill concentrate grade = 30%
- Smelting loss = 10 kg/te of concentrate
- Refining loss – 5 kg/ te of blister copper.
- Gross value of copper/kg = Rs.600
- Cost of mining / milling per ton of Ore including amortization and depreciation costs per ton of Ore = Rs.600 .
- Transport cost from mill to refinery per ton of Ore (@ Rs.100 / ton of concentrate)
- Smelting and refining costs per ton of Ore (@ Rs.300 / ton of concentrate)
- Other costs to be taken as (@20% of the above costs) per ton of Ore. **(20 Marks)**

OR

8 a. As a Mine's Manager Planning, what are the criteria do you prefer for selection of stoping methods in underground metalliferous mines, discuss in details. **(14 Marks)**

b. Explain the objectives of work study. **(06 Marks)**

Module-5

9 a. Define mine closure and state types of mine closure. Under what conditions mine/mining activities are ceased. **(10 Marks)**

b. Summarize the immediate impacts of unplanned mine closure on the mining community. **(10 Marks)**

OR

10 Discuss the following with respect to effective mine closure :
  a. Surface facilities. **(05 Marks)**
  b. Underground facilities. **(05 Marks)**
  c. Socio-economics. **(10 Marks)**

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