CBCS SCHEME

USN | | | | | | | | | | |

18MN641

Sixth Semester B.E. Degree Examination, June/July 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. List out the various mine laws to be considered while planning for new mine. **(10 Marks)**

b. Summarize the impacts due to mining activities on the society. **(10 Marks)**

OR

2 a. Mention the factors to be considered during selection of optimum plant site locations for constructions. **(12 Marks)**

b. What do you mean by 'Stockholm Conference 1972'? Where was it organized? What are the main agenda and outcome of this conference? **(08 Marks)**

Module-2

3 a. Summarize the importance and need of mine planning. **(08 Marks)**

b. Summarize in brief, the three stages involved during mine planning. **(12 Marks)**

OR

4 a. Summarize the details to be furnished during preparation of Detailed Project Report of underground mine projects. **(14 Marks)**

b. Mention the factors affecting the division of coal field into mining areas. **(06 Marks)**

Module-3

5 The following are the data of a new underground coal mine:

i) Thickness of a Seam A = 1.0m ; Seam B = 1.2m ; Seam C = 1.4m
ii) Weight of 1 m^3 coal seam (equal for all seams) = 1.35 t/m^3
iii) Annual planned output of the mine = 11,00,000 t/yr
iv) Daily planned output of the mine = 3666 tons
v) Coefficient of recovery (equal for all seams) = 0.95.
vi) Length of the productive face (equal for all seams) = 120m
vii) Width of the web (equal for all seams) = 1.3m
viii) No. of cycles in the face per day (equal for all seams) = 2
ix) Cyclic coefficient (equal for all seams) = 0.8
x) Coefficient accounting for the percentage of coal output from productive faces (equal for all seams) = 0.95
xi) Gradient of all the seams = 12°

Determine :

a. The planned output from the faces **(12 Marks)**

b. The number of the productive faces in the mining property **(04 Marks)**

c. Make arrangement of the faces within the mining area. **(04 Marks)**

OR

6 a. Explain in details the division of mining property into level divisions. **(10 Marks)**

b. Explain in details the division of mining property into panel divisions. **(10 Marks)**

Module-4

7 Determine the break-even cut-off grade for a copper mine assuming the following data:

i) Mill recovery = 90%
ii) Mill concentrate grade = 30%
iii) Smelting loss = 10 kg/te of concentrate
iv) Refining loss = 5 kg/te of blister copper
v) Gross value of copper/kg = Rs. 600
vi) Cost of mining/milling per ton of ore including amortization and depreciation per ton of ore = Rs.600
vii) Transport cost from mill to refinery per ton of ore (@ Rs.100/ton of concentrate)
viii) Smelting and refining costs per ton of ore @ Rs. 300/ton of concentrate).
ix) Other costs to be taken as (@20% of the above costs) per ton of ore. **(20 Marks)**

OR

8 a. Describe how time study and work study helps in improvement of production in mines. **(08 Marks)**

b. Explain the selection criteria for stoping methods in underground metalliferrous mines. **(12 Marks)**

Module-5

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

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

OR

10 a. Summarize the IBM guidelines to be followed while preparing mine closure plan. **(14 Marks)**

b. Mention the corrective measures to be applied for minimizing economic impacts of mine closure on mining communities. **(06 Marks)**

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