



CBCS SCHEME

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Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020

Underground Mine Planning and Design

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Explain the Government Role in mining and mine development. (08 Marks)
- b. Explain plant siting and construction. (04 Marks)
- c. Write a short note on impoundments and dams. (04 Marks)

OR

- 2 a. Explain the environmental consequences on air, water and land pollution because of mining. (08 Marks)
- b. Explain the process of Land Acquisition. (08 Marks)

Module-2

- 3 a. Explain the various stages of planning a new mines. (08 Marks)
- b. What is a prefeasibility study? When and why do companies undertake that study? What information does it include? What action would you as a member of the study initiate in case of positive or negative outcomes of prefeasibility study? (08 Marks)

OR

- 4 a. Draw a neat sketch of pit top layouts with turn table and label its parts for underground coal mines. (08 Marks)
- b. Draw a neat sketch of pit bottom layout for skip winding for underground coalmines and indicate its salient features. (08 Marks)

Module-3

- 5 a. Determine the inclined length of the level and number of levels that can be developed in a mining area, for the given conditions.
Daily coal output of the mine = 1500 tons
Annual rate of face advance = 400 m
Life of the mine = 35 years
Dip of the seam = 15°
Weight of 1 m^3 of the coal seam = 1.3 t/m^3
Thickness of seam = 1.5 m
Coefficient of recovery of coal = 0.88 (10 Marks)
- b. With a neat labeled sketch explain the division of mining property into levels and panels. (06 Marks)

OR

- 6 The following are the data of a new underground coal mine :
- Thickness of seam A = 1.0 m; seam B = 1.2 m and seam C = 1.4 m;
 Weight of 1 m³ coal (in-situ) seams/equal for all seams) = 1.35 t/m³;
 Annual planned output of the mine = 11,00,000 t/year;
 Daily planned output of mine = 4000 tons ;
 Coefficient of recovery (equal for seams) = 0.95;
 Length of the productive face ; Equal for all seams = 120 m;
 Width of the web ; equal for all seams = 1.3 m;
 Number of cycles in the face per day (equal for all seams) = 2 ;
 Cyclic coefficient (equal for all seams) = 0.8 ;
 Coefficient accounting for the percentage of coal output from productive faces (equal for all seams) = 0.95
 and gradient of the seam = 10°.
- Determine planned output from the faces, the number of the productive faces in the mining property, make arrangements of the faces within the mining area. (16 Marks)

Module-4

- 7 a. Describe the selection criteria for stoping methods in an underground metal mine. (08 Marks)
 b. With a suitable example explain the process of production scheduling. (04 Marks)
 c. List some of the applications of computers in stope design. (04 Marks)

OR

- 8 a. What is work study and time study? With a suitable example explain the applications of work study for improving productivity when an SDL is used in an underground metal mine. (08 Marks)
 b. Explain cut-off grade with an example. (04 Marks)
 c. Explain the process of calculating economics of each stope. (04 Marks)

Module-5

- 9 a. What are the sociological factors caused due to unplanned mine closure? Justify your answer with a case study. (08 Marks)
 b. Mention the factors to be considered for effective mine closure. (08 Marks)

OR

- 10 Write a short note on any two of the following Hydraulic mining, coal bed methane, underground coal gasification. (16 Marks)

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