CBCS SCHEME

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18MN52

Fifth Semester B.E. Degree Examination, Feb./Mar. 2022
Underground Coal Mining

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Define the following :
Face, Gallery, Pillar, Goaf, Barrier, Incubation period. **(06 Marks)**

b. The following Fig.Q1(b) shows the position of the coal deposit, as a manager of mine planning department, which mode of access do you prefer to reach the seam, give reason for your answer. Explain the method in brief along with its merits and demerits.

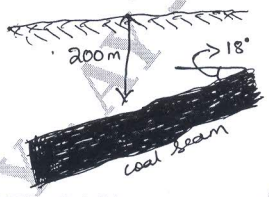

Fig.Q1(b) **(14 Marks)**

OR

2 a. Discuss how depth, thickness and gassiness of the seam influences the choice of coal mining methods. **(10 Marks)**

b. Differentiate between Longwall mining and Bord and Pillar mining methods. **(10 Marks)**

Module-2

3 a. In a B&P mining, the width of the pillar and galleries are 19.5 and 3m respectively. Determine percentage of extraction during development. **(04 Marks)**

b. The 4m thick coal seam dipping 1 in 8 and occurring at a depth of 220m is proposed to be developed by B&P pattern. The mine is expected to produce 500 t/day/panel. Draw a neat layout of panel showing number of heading, number of faces, air stopping, intake and return airways. List out the equipments you would deploy and workers in the panel. Assume any other relevant conditions. Finally determine OMS. **(16 Marks)**

OR

4 a. Explain the sequence of extraction of pillar for correct declination of fracture of roof strata. **(10 Marks)**

b. Explain the factors to be considered to determine the size of pillars in B&P method of mining. **(10 Marks)**

Module-3

5 a. Explain the elements of longwall panel with a neat sketch. **(08 Marks)**

b. Explain the factors affecting longwall mining. **(12 Marks)**

OR

6 a. Draw neat layouts of conventional and modern longwall faces. **(12 Marks)**

b. Explain the factors affecting length and width of longwall panel. **(08 Marks)**

Module-4

7 a. Explain in detail, the sequence of exploitation of 1.2m thick seam with plough machine. **(14 Marks)**

b. A mine is being developed by longwall method with a gate road size 4.8m × 2.4m. The mine operates in 3 shifts per day and six faces are blasted per shift. The average pull per round of blast is 1.35m and the bulk density of coal is 1.4 t/m^3. If the OMS is 3.5, then determine the average manpower deployed in the development section per shift. **(06 Marks)**

OR

8 a. Explain in detail, the sequence involved in exploitation of 2.5m thick seam with shearer machine. **(14 Marks)**

b. In a 4.8m wide and 3.0m high gate road in a seam, 12 shot holes are blasted per round. The holes are charged with two explosive cartridges of 425 gm each. If the powder factor of the blast is 2 te/kg and density of coal is 1.4 t/m^3, determine pull per round of blast in meters. **(06 Marks)**

Module-5

9 a. Explain briefly the exploitation of thick coal seam by tap coal caving method. **(10 Marks)**

b. What is gasification of coal? Briefly explain the basic principle of gasification of coal. **(10 Marks)**

OR

10 a. Explain briefly the exploitation of thick coal seam by sub-level caving method. **(10 Marks)**

b. Mention type of slicing method. Explain any one slicing method with its limitations. **(10 Marks)**

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