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10MN831

Eighth Semester B.E. Degree Examination, Jan./Feb. 2021
Mine Transport System

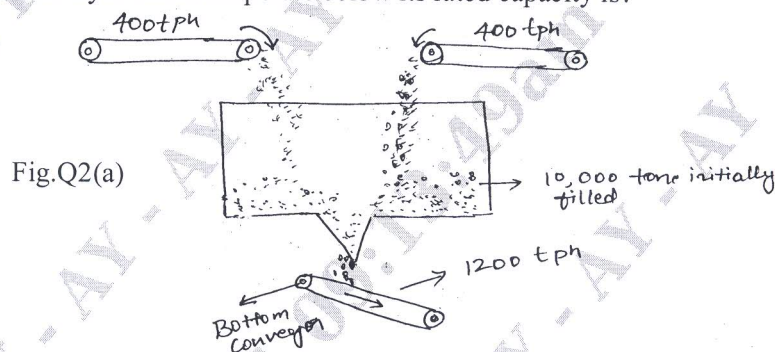
Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART - A

- 1 a. Explain the Techno - economic indices of mine transport system. (10 Marks)
b. What are the difference between the transporting materials using gravity and conveyors? (10 Marks)
- 2 a. From the Fig. Q2(a) two belt conveyors load a ground bunker, each at a rate of 400 tph, which is initially filled with 10,000 tonnes of coal, coal is discharged from the bottom of the ground bunker onto a belt conveyor at a rate of 1200 tph. The time elapsed in hours before the bottom conveyor starts to operate below its rated capacity is? (07 Marks)



- b. A belt conveyor conveys a material of average cross - sectional area of 0.09m^2 of bulk density 1.5 tonne/m^3 at a speed of 2m/s . What will be the carrying capacity of the belt conveyor in tones? (03 Marks)
- c. With a neat sketch, explain the parts of an scraper chain conveyor. (10 Marks)
- 3 a. What are the essentials of good Haulage tracks? (10 Marks)
b. Write short notes on Man riding cars. (10 Marks)
- 4 a. Enlist the different types of Ropes haulages in an underground mines. What are the main advantages of direct haulage? (10 Marks)
b. An endless haulage operates on a roadway 800m long dipping at 1 in 15 draws 600 tonnes of coal a shift (1 shift = 7.5 hrs effective time). The loads weigh 1500 Kgf each and the empties 500 Kgf. The rope weighs 3 Kgf/m, tub friction is 1/50 and rope friction is 1/10. Speed of the rope is 4km/h. Estimate the power required at the surge wheel. The loads are pulled up the gradient. (10 Marks)

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PART - B

- 5 a. Enlist the various types of Locomotives used in mine transport system. What are disadvantages of using a Diesel Locomotive compared to Battery Locomotive and Trolley wire Locomotive? (10 Marks)
- b. With a neat sketch, explain and label the parts of an Battery Operated Shuttle car. (10 Marks)
- 6 a. Explain Hydraulic Breaking and list the advantages of hydraulic transportation in underground coal mining. (10 Marks)
- b. Explain in detail the use of centrifugal pumps used in hydraulic transportation. (10 Marks)
- 7 Define an Aerial Rope way. Discuss its type and advantages. (20 Marks)
- 8 a. List some commonly occurring maintenance related accidents in underground coal mines. (08 Marks)
- b. List some of the hazardous process and events in a mining system. What are the preventive measures against these hazardous process and events to ensure safety to men and machineries employed in an mine? (12 Marks)
