



MECHOI

10MN44

Fourth Semester B.E. Degree Examination, June/July 2019 Mining Machinery - I

Time: 3 hrs.

Max. Marks: 100

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

PART - A

- a. Maintenance of tracks in underground mines is important. Why? How do they do that?
 (08 Marks)
 - b. Explain briefly the requirements of good Ballasts, Sleepers and Rails, which are used for underground track. (12 Marks)
- 2 a. With a neat sketch of centrifugal compressor, explain the working and mention its limitations. (08 Marks)
 - b. Explain the utilization of compressed air in jack hammar with neat sketch. (08 Marks)
 - c. Name and explain any one safety device used near tracks in underground. (04 Marks)
- 3 a. Explain techno economic indices of mine transport system with the necessary equations.
 (10 Marks)
 - b. With the neat sketches, explain the different types of clips used for attaching the tubs in endless rope haulage. (10 Marks)
- 4 a. Explain on what bases, the wire ropes are selected for effective and safe utilization in mines.

 (10 Marks)
 - b. Describe how reliance capel is fitted to a winding rope. Illustrate the same with neat sketch.

 (10 Marks)

PART - B

- 5 a. Find the effective H.P exerted by a locomotive engine which draws a train up an incline of 1 in 200 at the rate of 50km/hr. The weight of the engine and train is 90 tonnes and the frictional resistance is 6kg/tone.

 (10 Marks)
 - b. Name the different types of locomotives used in underground mines. Compare their relative merits and demerits. (10 Marks)
- a. A 90cm trunk belt is to be installed in a road way 2500m long rising 1 in 100. Calculate the power of the motor to run the loaded belt when it is rated to carry 250 tonnes of coal an hour at a speed of 130 meters per minute. Assume the friction factor to be 0.02 and weight of idlers and belt in kg/m run of conveyor to be 70 kgs. The belt takes 60 seconds to pick up the velocity.

 (12 Marks)
 - b. Write a short note on Shaker conveyors.

- (08 Marks)
- 7 a. Draw a neat sketch of a king Detaching Safety Hook showing its different parts and its position if an over winding occurs. (10 Marks)
 - Name the four different shapes of drums used in Indian mines for winding systems and explain any two with neat sketches.
- 8 a. Find out the static torque at the beginning, middle and at the end of the wind when each cage weighs 10 tonnes, carries 6 tubs taring 0.6 tonnes and holding 1 tonne of coal. Take drum diameter to be 2.5m and the depth of the shaft 1000m. The rope weighs 9 tonnes.

 (10 Marks)
 - b. Draw the neat sketches of Single Drum and Double Drum systems of hoisting. (10 Marks)