



CBCS SCHEME

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15MN44

Fourth Semester B.E. Degree Examination, Aug./Sept.2020 Mine Mechanization – I

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Explain about the Rocker Shovel with a neat sketch. (08 Marks)
b. Briefly explain about the techno-economic indices of mine transport system. (08 Marks)

OR

- 2 a. State the different laws governing compression and expansion of gases and also write their formulas. (08 Marks)
b. Briefly explain about the transmission of compressed air. (08 Marks)

Module-2

- 3 a. What are the precautions to be taken during storage and use of wire ropes? (08 Marks)
b. With neat sketch, explain the method of splicing a wire rope. (08 Marks)

OR

- 4 a. With a neat sketch, explain the working of Endless rope haulage. (08 Marks)
b. 650 tons of coal will have to be hauled up in 6.5 hours of effective hauling time, from an incline of 1000m long. Calculate the size of the rope and the coal carried per effective pay journey on the basis of the following:
Tare weight = 1.25 tons
Capacity/car = 3 tons of coal
Speed = 20 km/hr
Inclination = 1 in 10
Co-efficient of friction of cars = $\frac{1}{56}$
Factor of safety = 10 (08 Marks)

Module-3

- 5 a. With a neat sketch, explain about the scraper chain conveyor. (08 Marks)
b. With a neat sketch, explain about the trolley wire locomotive. (08 Marks)

OR

- 6 a. With a neat sketch, explain about the Belt conveyor. (08 Marks)
b. A 10-ton locomotive hauls a train of 50 tonnes down a gradient of 1 in 100 at a speed of 15km per hour. Brakes are applied onto the locomotive to bring the train to rest. Calculate:
i) The gross-braking effort
ii) The effective retarding force
iii) The rate of retardation and
iv) The time taken to stop the train. (08 Marks)

Module-4

- 7 a. With a neat sketch, explain about ground mounted Koepe winder. (08 Marks)
b. With a neat sketch, explain about the cage. (08 Marks)

OR

- 8 a. With a diagram, discuss about the shapes of drum. (08 Marks)
b. 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 taking 0.5 tonnes and holding 1 tonne of coal. Take drum diameter to be 2.5m and the depth of the shaft 1000m. The rope weighs 10 tonnes. (08 Marks)

Module-5

- 9 a. With a neat sketch, explain the working principle of mechanical braker. (08 Marks)
b. With a sketch, explain the pit-bottom layout. (08 Marks)

OR

- 10 a. List the safety devices on winder. With a neat sketch, explain safety brake. (08 Marks)
b. Write a note on Track laying and maintenance. (08 Marks)

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