

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV(NEW) EXAMINATION – WINTER 2022****Subject Code:3142201****Date:13-12-2022****Subject Name:Mining Machinery - I****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) What is space factor of wire rope? How mass and strength of wire ropes is determined?	03
	(b) Explain various types of aerial ropeway system.	04
	(c) What do you mean by rope splicing? Describe the full procedure of splicing a wire rope with neat sketch.	07
Q.2	(a) Discuss the important feature of a good haulage track	03
	(b) Describe the advantages of compressed air over other power sources.	04
	(c) What do you understand by Capping of Rope? Write a brief note on coned-socket type capel with neat sketch.	07
	OR	
	(c) A locomotive and train have a total mass of 400 tonnes. The resistance opposing motion can be assumed to be constant and amounts to 70 N/tonne. If the locomotive can exert a constant pull of 90 kN. Find how long it will take to accelerate the train from 4 km/hr to 50 km/hr on level track.	07
Q.3	(a) Discuss the various applications of aerial ropeway.	03
	(b) Differentiate between the term stranded and non-stranded rope.	04
	(c) Explain pipe line and distributions of compressed air used in mines.	07
	OR	
Q.3	(a) Write short note on Clifton pulley.	03
	(b) A wire rope, flattened stranded with fibre core, has a diameter of 2.56 cm. If the steel has a tensile strength of 160 kg/mm ² , find out the total mass of the rope and breaking strength in SI units if the length of the rope is 105 m.	04
	(c) Explain the following terms with neat sketch:	07
	(a) Monkey or Back Catch	
	(b) Drop Warwick	
Q.4	(a) Discuss the causes of deterioration of wire ropes.	03
	(b) Sketch the layout of battery charging room used for battery operated electric locomotives in underground mines.	04
	(c) Explain endless rope haulage system with neat sketch.	07
	OR	
Q.4	(a) Suggest the suitable type of rope to be used as: Mobile Cranes, Dozers, Dipper shovel ropes, Arial Rope way.	03
	(b) Describe the construction and operation of low profile dumper.	04

- (c) Why rope clips are used in rope haulage system? Explain different types of rope clips with neat sketch. **07**
- Q.5** (a) Discuss the care of wire ropes during storage and usage. **03**
(b) Differentiate between direct rope haulage system and endless rope haulage system. **04**
(c) Write a brief note on trolley wire locomotive. **07**
- OR**
- Q.5** (a) Draw the sketch of mine track layout **03**
(b) What different test should be carried out for wire testing prescribed by IS specifications? **04**
(c) An endless haulage operates on a roadway 600 m long dipping at 1 in 12 and draws 650 tonnes of coal a shift (1 shift = 7 hours effective time). An empty tub weighs 500 kgf and its carrying capacity is 1000 kgf of coal. The rope mass 3.5kgf/m, tub friction is 1/50 and rope friction is 1/20. Speed of the rope is 5.5 km/hr. Estimate the power required by the motor. The loads are pulled up the gradient. **07**
