

# GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-IV EXAMINATION – SUMMER 2025

Subject Code:3142201

Date:08-05-2025

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) Discuss the various applications of aerial ropeway.	03
	(b) List out types of mine locomotives. Explain any one.	04
	(c) Explain the construction and installation of aerial ropeway.	07
Q.2	(a) Define the following term: Backstay, Back catch and Drop warwick.	03
	(b) Explain various types of aerial ropeway system.	04
	(c) Explain endless rope haulage with neat sketch.	07
<b>OR</b>		
	(c) Explain main & tail rope haulage with neat sketches.	07
Q.3	(a) Discuss the advantages of gravity rope haulage.	03
	(b) Describe the advantages of compressed air over other power sources.	04
	(c) Explain the construction of mine tubs and car with neat sketch.	07
<b>OR</b>		
Q.3	(a) List out different methods of transport system used in underground mine.	03
	(b) Describe rope tensioning arrangement in aerial ropeway.	04
	(c) Explain the construction and operation of mine locomotives.	07
Q.4	(a) Discuss the important feature of a good haulage track.	03
	(b) Describe the process of capping and rope capels in brief.	04
	(c) Describe haulage track, its laying and maintenance in brief.	07
<b>OR</b>		
Q.4	(a) Explain the working of scraper chain conveyor.	03
	(b) Describe the criteria for selection of wire ropes.	04
	(c) Explain lang's lay and ordinary lay in wire rope.	07
Q.5	(a) Explain any one loop take up arrangement for belt conveyor system.	03
	(b) Describe the construction and operation of low profile dumper.	04
	(c) Explain pipe line and distributions of compressed air used mines.	07
<b>OR</b>		
Q.5	(a) Describe rope splicing in details.	03
	(b) Describe the construction and operation of shuttle car.	04
	(c) Explain the various types and construction of wire ropes.	07

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**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER– IV(NEW) EXAMINATION – SUMMER 2023**

**Subject Code:3142201****Date:07-07-2023****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
<b>Q.1</b>	(a) Differentiate between Lang's lay and Ordinary lay with neat sketch.	<b>03</b>
	(b) Discuss advantages & disadvantages of endless rope haulage.	<b>04</b>
	(c) What do you mean by capping of rope? Explain Interlocking wedge type capel (Reliance capel) with neat sketch.	<b>07</b>
<b>Q.2</b>	(a) Why rope clips are used in rope haulage system? Explain cam clip with neat sketch.	<b>03</b>
	(b) Discuss the process of Rope splicing.	<b>04</b>
	(c) Explain main & tail rope haulage system with neat sketch.	<b>07</b>
<b>OR</b>		
	(c) An endless haulage operates on a roadway 550 m long dipping at 1 in 12 and draws 550 tonnes of coal a shift (1 shift = 6 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 5.0 km/hr. Estimate the power required by the motor. The loads are pulled up the gradient.	<b>07</b>
<b>Q.3</b>	(a) Name the parameters affecting the selection of wire rope.	<b>03</b>
	(b) State the type of rope to be used for: (a) Coal Cutting Machine (b) Winding Rope (c) Haulage Ropes (d) Dragline Hoist Rope	<b>04</b>
	(c) What are the different types of safety devices used on haulage roads? Explain with neat sketches.	<b>07</b>
<b>OR</b>		
<b>Q.3</b>	(a) What is space factor of wire rope? How mass and strength of wire ropes is determined?	<b>03</b>
	(b) Explain various types of aerial ropeway system.	<b>04</b>
	(c) What are the types of compressor used in mine? Explain any one in detail.	<b>07</b>
<b>Q.4</b>	(a) What are the limitations on the use of different types of locomotives in underground mines?	<b>03</b>
	(b) Write the applicable conditions and application of aerial ropeway system.	<b>04</b>
	(c) A locomotive and train have a total mass of 550 tonnes. The resistance opposing motion can be assumed to be constant and amounts to 68 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 45 km/hr on level track.	<b>07</b>
<b>OR</b>		
<b>Q.4</b>	(a) Write the applications and construction of shuttle car.	<b>03</b>
	(b) Sketch the layout of battery charging room used for battery operated electric locomotives in underground mines.	<b>04</b>
	(c) Write a brief note on belt conveyor system.	<b>07</b>

- Q.5 (a)** What are the advantages of compressed air over other power sources? **03**
- (b)** What precautions should be taken for gage selection and lying down of tracks? **04**
- (c)** Explain the rope tensioning arrangement of aerial ropeway. **07**
- OR**
- Q.5 (a)** Sketch track layout of direct rope haulage. **03**
- (b)** A wire rope, flattened stranded with fibre core, has a diameter of 32 mm. If the steel has a tensile strength of 160 kg/mm<sup>2</sup>, find out the total mass of the rope and breaking strength in SI units if the length of the rope is 115 m. **04**
- (c)** Explain overhead trolley wire locomotive in detail. **07**

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**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER– IV(NEW) EXAMINATION – SUMMER 2023**

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**Time: 10:30 AM TO 01:00 PM**

**Total Marks:70**

**Instructions:**

1. Attempt all questions.
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4. Simple and non-programmable scientific calculators are allowed.

		MARKS
<b>Q.1</b>	(a) Differentiate between Lang's lay and Ordinary lay with neat sketch.	<b>03</b>
	(b) Discuss advantages & disadvantages of endless rope haulage.	<b>04</b>
	(c) What do you mean by capping of rope? Explain Interlocking wedge type capel (Reliance capel) with neat sketch.	<b>07</b>
<b>Q.2</b>	(a) Why rope clips are used in rope haulage system? Explain cam clip with neat sketch.	<b>03</b>
	(b) Discuss the process of Rope splicing.	<b>04</b>
	(c) Explain main & tail rope haulage system with neat sketch.	<b>07</b>
<b>OR</b>		
	(c) An endless haulage operates on a roadway 550 m long dipping at 1 in 12 and draws 550 tonnes of coal a shift (1 shift = 6 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 5.0 km/hr. Estimate the power required by the motor. The loads are pulled up the gradient.	<b>07</b>
<b>Q.3</b>	(a) Name the parameters affecting the selection of wire rope.	<b>03</b>
	(b) State the type of rope to be used for: (a) Coal Cutting Machine (b) Winding Rope (c) Haulage Ropes (d) Dragline Hoist Rope	<b>04</b>
	(c) What are the different types of safety devices used on haulage roads? Explain with neat sketches.	<b>07</b>
<b>OR</b>		
<b>Q.3</b>	(a) What is space factor of wire rope? How mass and strength of wire ropes is determined?	<b>03</b>
	(b) Explain various types of aerial ropeway system.	<b>04</b>
	(c) What are the types of compressor used in mine? Explain any one in detail.	<b>07</b>
<b>Q.4</b>	(a) What are the limitations on the use of different types of locomotives in underground mines?	<b>03</b>
	(b) Write the applicable conditions and application of aerial ropeway system.	<b>04</b>
	(c) A locomotive and train have a total mass of 550 tonnes. The resistance opposing motion can be assumed to be constant and amounts to 68 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 45 km/hr on level track.	<b>07</b>
<b>OR</b>		
<b>Q.4</b>	(a) Write the applications and construction of shuttle car.	<b>03</b>
	(b) Sketch the layout of battery charging room used for battery operated electric locomotives in underground mines.	<b>04</b>
	(c) Write a brief note on belt conveyor system.	<b>07</b>

- Q.5 (a)** What are the advantages of compressed air over other power sources? **03**
- (b)** What precautions should be taken for gage selection and lying down of tracks? **04**
- (c)** Explain the rope tensioning arrangement of aerial ropeway. **07**
- OR**
- Q.5 (a)** Sketch track layout of direct rope haulage. **03**
- (b)** A wire rope, flattened stranded with fibre core, has a diameter of 32 mm. If the steel has a tensile strength of 160 kg/mm<sup>2</sup>, find out the total mass of the rope and breaking strength in SI units if the length of the rope is 115 m. **04**
- (c)** Explain overhead trolley wire locomotive in detail. **07**

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**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER-IV (NEW) EXAMINATION – SUMMER 2022**

Subject Code:3142201

Date:23-06-2022

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
<b>Q.1</b>	(a) Write the uses of wire ropes	<b>03</b>
	(b) Write a short note on low profile dumper.	<b>04</b>
	(c) Explain the application of over head trolley wire locomotive.	<b>07</b>
<b>Q.2</b>	(a) Write the functions of the following:	<b>03</b>
	i. Back catch	
	ii. Stopblock	
	iii. Backstay.	
	(b) Explain the application of rope capels and process of rope capping	<b>04</b>
	(c) Write a note on exhaust conditioner and flame trap used in diesel locomotive.	<b>07</b>
	<b>OR</b>	
	(c) Name different rope haulage systems. Explain the main and tail with neat sketch.	<b>07</b>
<b>Q.3</b>	(a) Write the applications of shuttle car	<b>03</b>
	(b) Write the essential conditions of good haulage track.	<b>04</b>
	(c) Name different rope capels used in underground mines. Explain any one.	<b>07</b>
	<b>OR</b>	
<b>Q.3</b>	(a) What do you mean by rope splicing?	<b>03</b>
	(b) Classify the principle types of mechanical brakes used for mining machineries. Explain any one.	<b>04</b>
	(c) Write a note on construction and installation operation of aerial ropeways.	<b>07</b>
<b>Q.4</b>	(a) What do you mean by non-stranded rope?	<b>03</b>
	(b) State the limitations for the working of endless rope haulage system. Also state its advantages and disadvantage.	<b>04</b>
	(c) What are the different types of locomotives used in Underground coal mines? Explain diesel locomotive in detail.	<b>07</b>
	<b>OR</b>	
<b>Q.4</b>	(a) What are the limitations on the use of different types of locomotives in underground mines?	<b>03</b>
	(b) Describe the advantages of compressed air over other power sources.	<b>04</b>
	(c) Why rope clips are used in rope haulage system? Explain different types of rope clips with neat sketch.	<b>07</b>
<b>Q.5</b>	(a) Write short note on Clifton pulley.	<b>03</b>
	(b) Explain various types of aerial ropeway system.	<b>04</b>
	(c) Explain pipe line and distributions of compressed air used mines	<b>07</b>

**OR**

- Q.5** (a) What is space factor of wire rope? How mass and strength of wire ropes is determined? **03**
- (b) Explain lang's lay and ordinary lay in wire rope. **04**
- (c) Explain the process of rope splicing step by step. **07**

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