

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-IV(NEW) – EXAMINATION – SUMMER 2019****Subject Code:2142201****Date:15/05/2019****Subject Name: Mining Machinery-I****Time:02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

MARKS

- Q.1** (a) What do you mean by non-stranded rope? **03**  
(b) Differentiate between Lang's lay and Ordinary lay with neat sketch. **04**  
(c) Explain main & tail rope haulage with neat sketches. **07**
- Q.2** (a) Write short note on shuttle car. **03**  
(b) Explain various types of aerial ropeway system. **04**  
(c) Describe in detail different types of rope capels used in wire rope. **07**
- OR**
- (c) An endless haulage operates on a roadway 700 m long dipping at 1 in 12 and draws 600 tonnes of coal a shift (1 shift = 7.5 hours effective time). An empty tub weighs 500 kgf and its carrying capacity is 1000 kgf of coal. The rope weighs 3.2kgf/m, tub friction is 1/50 and rope friction is 1/20. Speed of the rope is 5 km/hr. Estimate the power required by the motor. The loads are pulled up the gradient. **07**
- Q.3** (a) Discuss the various applications of aerial ropeway. **03**  
(b) Describe the advantages of compressed air over other power sources. **04**  
(c) Explain pipe line and distributions of compressed air used in mines. **07**
- OR**
- Q.3** (a) Discuss the important feature of a good haulage track **03**  
(b) State the type of rope to be used for: **04**  
(a) Coal Cutting Machine  
(b) Winding Rope  
(c) Haulage Ropes  
(d) Dragline Hoist Rope  
(c) What do you mean by rope splicing? Describe the full procedure of splicing a wire rope with neat sketch. **07**
- Q.4** (a) Write short note on Clifton pulley. **03**  
(b) A locked coil wire rope has a diameter of 45 mm. If the steel has a tensile strength of 170 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 150 m. **04**  
(c) What are the different types of safety devices used on haulage roads? Explain with neat sketches. **07**
- OR**
- Q.4** (a) What is space factor of wire rope? How mass and strength of wire ropes is determined? **03**  
(b) Discuss the factors affecting the selection of wire rope? Also explain the care of wire ropes during storage and use. **04**  
(c) Why rope clips are used in rope haulage system? Explain different types of rope clips with neat sketch. **07**
- Q.5** (a) What are the limitations on the use of different types of locomotives in underground mines? **03**

- (b) Describe the construction and operation of low profile dumper. **04**  
www.FirstRanker.com www.FirstRanker.com
- (c) A direct rope haulage pulls 12 loaded tubs at a time up an incline dipping at 1 in 8. **07**  
An empty tub weighs 350 kg and has a capacity of 950 kg of mineral. Length of the roadway covered by the haulage is 600 m. The rope diameter is 35 mm. Rope speed is 10 km/hr. Coefficient of friction for the tubs and for rope is 1/40 and 1/20 respectively. Find the power required by the engine.

**OR**

- Q.5** (a) Discuss the advantages of gravity rope haulage. **03**
- (b) State the limitations for the working of endless rope haulage system. Also state its advantages and disadvantage. **04**
- (c) What are the different types of locomotives used in Underground coal mines? **07**  
Explain diesel locomotive in detail.

\*\*\*\*\*

www.FirstRanker.com