

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V(NEW) EXAMINATION – SUMMER 2022****Subject Code:3152201****Date:04/06/2022****Subject Name:Mine Machinery II****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.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) List the importance of winding in mining.	03
	(b) Name different shaft fittings used during winding.	04
	(c) Draw and explain design of headgear arrangement.	07
Q.2	(a) Give classification of winding.	03
	(b) The centre lines of winding drum and winding pulley are parallel and 0.6m apart. When one cage is at pit bottom, its winding rope is positioned at 1.8m from the drum centre. The plan distance between the winding drum and the winding pulley axes is 60m, the fleet angle of installation is?	04
	(c) Explain drum winding using neat diagram.	07
	OR	
	(c) Give advantages and disadvantages of drum winding.	07
Q.3	(a) Explain the working principle of Koepe winding.	03
	(b) Draw and explain torque- time diagram of:	04
	i. Koepe winding with tail rope	
	ii. Koepe winding without tail rope.	
	(c) Explain advantages and disadvantages of Koepe winding.	07
	OR	
Q.3	(a) For tower mounted friction hoist having a coefficient of friction between the rope and the sheave of 0.30, the wrap factor $C^{\mu\theta}$ is _____.	03
	(b) Draw torque-time diagram of:	04
	i. Cylindrical drum with tail rope	
	ii. Cylindrical drum without tail rope	
	(c) Explain advantages of multi rope winding.	07
Q.4	(a) Classify different pit top and pit bottom layouts.	03
	(b) Explain:	04
	i. Lofco system	
	ii. Turntable system	
	(c) Explain Ward Leonard method of speed control using well labeled diagram.	07
	OR	
Q.4	(a) Classify braking system used on winders.	03
	(b) Ore is hoisted from 620m depth using a single skip of 7 tonne payload. The skip winding system has constant acceleration/ deceleration of 1m/s^2 and a constant speed of 10m/s . the skip loading time are 120sec and 60sec respectively. Considering the overall utilization of the skip as 70%, the maximum daily capacity of the winding system, in tonne, is _____.	04
	(c) Classify and explain mechanical brakes used on winders.	07

- Q.5** (a) Explain the factors influencing efficiency of coal cutting equipment. **03**
- (b) A tower mounted friction hoist has a driving sheave of 4m diameter, which can transmit, under just slipping condition, a power of 200 kW while rotating at 60 rpm. Assuming coefficient of friction between rope and rope tread is 0.4, the maximum possible rope tension in kN on the heavier side of the sheave is_____. **04**
- (c) Explain the constructional features and working of power loaders. **07**
- OR**
- Q.5** (a) Write short note on: **03**
- i. Cage
- ii. Skip
- (b) Write a note on safety devices used on winders. **04**
- (c) Explain the constructional features and working of continuous miner. **07**
