Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – WINTER 2022

Subject Code:3152201 Date:06-01-2023

Subject Name:Mine Machinery II

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)**	How the height of the headgear is decided? Also write the purpose of headgear.	**03**
	(b)	Explain ward Leonard method of speed control in winders with neat sketch.	**04**
	(c)	What is friction winder? State the advantages and disadvantages of multi-rope friction winder.	**07**
Q.2	**(a)**	What do you mean by angle of fleet? Explain with neat sketch.	**03**
	(b)	What are the objectives of pit top & pit bottom layout? Also write the factors affecting pit top & pit bottom layout.	**04**
	(c)	Calculate the torques for a tower mounted friction winder with the following data; Shaft Depth: 410 m, Empty skip weight: 4.5 tef, Loaded skip weight: 9.0 tef friction drum diameter: 3.0 m, Acceleration time: 14 s, Retardation time: 12 s Constant speed time: 25 s, Rope weight: 5.65 kgf/m length, decking time: 15 s Rope speed: 7.50 m/s, Tower height: 20 m, Bottom rope loop: 10 m Moment of inertia of the friction pulley and the motor is 22 te-m^2 and assume static torque due to friction 0.07 times the torque due to loaded skip plus empty skip.	**07**
		OR	
	(c)	What are the different methods of electrical braking of winders? Describe in detail.	**07**
Q.3	**(a)**	Draw the sketch of cage attachment to winding rope.	**03**
	(b)	Explain Lofco system with neat sketch.	**04**
	(c)	What is the role of safety detaching hook? Explain king detaching safety hook with neat sketch.	**07**
		OR	
Q.3	**(a)**	What is good about Simba Drill machine using in metal mine?	**03**
	(b)	Explain Low Profile Dump Trucks (LPDT) with its features. Also write the name of its manufacturers.	**04**
	(c)	Explain the following terms with neat sketch: (a) Turntable Circuit (b) Back Shunt Circuit	**07**
Q.4	**(a)**	How torque is generated in winding? Also write the importance of Torque in winding system?	**03**
	(b)	What are the advantages of using a coal cutting machine in a mine?	**04**
	(c)	Describe the components or parts of Reciprocating pump in detail with diagram.	**07**
		OR	
Q.4	**(a)**	Write the factors affecting the selection of load haul dumper. Also state the advantages and disadvantages.	**03**
	(b)	Explain loop type and Reversing track type layout for locomotive haulage.	**04**
	(c)	Explain the working of Reciprocating Pump in detail. Also state its advantages and disadvantages.	**07**
Q.5	**(a)**	How carrying capacity of belt conveyor is calculated? Explain with one example.	**03**
	(b)	Write a brief note on Armoured Face Conveyor (AFC).	**04**
	(c)	Explain the construction and operation of shearer. Also state its advantages.	**07**

OR

Q.5	**(a)**	Write a short note on side discharge loader.	**03**
	(b)	What are the factors affecting the design of belt conveyor? Also state its limitations.	**04**
	(c)	A turbine pump has six impellers, 30 cm diameter running at 1440 r.p.m. angle of blade tip = 90° (Backward blade), radial velocity of water = 2.4 m/s, area of impeller outlet = 0.0175 m^2 For what rate of delivery of water in m^3/min and total head should the pump be suitable? Also calculate the width of impeller outlet around its periphery.	**07**

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