Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – SUMMER 2022

Subject Code:3171928 Date:14/06/2022

Subject Name:Design of Material Handling Equipment

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.**

Q.1	**(a)**	List only types of material handling equipments.	**03**
	(b)	Describe the objectives of material handling system.	**04**
	(c)	Discuss the guideline in selecting materials handling equipments.	**07**
Q.2	**(a)**	Discuss about types of conveyor belts.	**03**
	(b)	Draw a neat sketch and explain design procedure for drive pulley.	**04**
	(c)	Three idler troughed belt horizontal conveyor is to be used to transmitting 360 ton/hour of mineral ore having weight density of 16700 N/m^3, the surcharge factor C for three idler through belt is 0.1. If belt speed is 120 m/min, select standard belt width for the conveyor belt. Take effective width of material storage on belt as (0.9B- 0.05) m. The available standard belt width are 400, 450,500,600,650,750,800,900,1000,1200,1400,1600,1800,2000mm	**07**
		OR	
	(c)	State and explain the different types of resisting forces acting on conveyor belt.	**07**
Q.3	**(a)**	How wire ropesa re designated ? State their applications.	**03**
	(b)	Explain the modes of failure of wire rope.	**04**
	(c)	5 Ton elevator is supported by 8 lines of 6x19 steel core wire rope of tensile designation 1570 determine diameter of wire rope and pulleys for long life and continuous operation, E= 83000 N.If factor of safety is 8 , what is the permissible static load of rope?Assume A= $0.404d^2$.D=24d, σba =0.0014Sut, Sut= 1570 N/mm^2.	**07**
		OR	
Q.3	**(a)**	With neat sketch explain lay of wire ropes.	**03**
	(b)	Discuss about rope sheaves and drum design procedure.	**04**
	(c)	Enlist section used in hook design. Write a design procedure of hook with triangular section.	**07**
Q.4	**(a)**	Sketch typical section of truss member and bridge girder.	**03**
	(b)	Discuss about materials used for crane design.	**04**
	(c)	Write a short note: Stability of crane design.	**07**
		OR	
Q.4	**(a)**	Discuss design consideration of rotary crane.	**03**
	(b)	Which kind of stresses / Loads are considered while structure design of crane ?	**04**
	(c)	Explain design procedure of revolving crane.	**07**

Q.5	**(a)**	Explain design consideration for packaging machinery.	**03**
	(b)	Write a short note on “Automatic storage and retrival system”	**04**
	(c)	Explain design procedure for bucket elevator loading.	**07**

OR

Q.5	**(a)**	Enlist types of bucket elevators .? Discuss one in brief.	**03**
	(b)	Explain design procedure for cage elevator.	**04**
	(c)	Write a short note on “Automatic guided vehicles”	**07**

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