Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER III (OLD) – • EXAMINATION – SUMMER 2017

Subject Code:730904 **Date : 04/05/2017**

Subject Name: Design Of Material Handling Equipments

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.**

Q.1	**(a)**	Discuss in details, the various factors to be considered in the selection of Material Handling Equipments.	**07**
	(b)	Explain the function and application of the following Material Handling Equipment's: a) Wagon Tippler b) Hopper c) Stacker Reclaimer	**07**
Q.2	**(a)**	Explain in detail, the functions performed by carcass and cover of the Conveyor Belt.	**07**
	(b)	Explain the importance of feeder in Belt conveyors. With the help of neat sketch, Explain the Mechanical Vibrating Feeder and Apron Feeder.	**07**
		OR	
	(b)	Explain the stability analysis of movable crane used in the railway for loading and unloading wagon.	**07**
Q.3	**(a)**	Describe the step by step procedure for design of Bucket Elevator.	**07**
	(b)	What are the different means for storing the bulk materials? Explain any three of them,	**07**
		OR	
Q.3	**(a)**	What is the function of Bucket Elevator? What are the different types of Bucket Elevator? Explain the salient features of each type of Bucket Elevator.	**07**
	(b)	What is the difference between consumer packaging and Industrial Packaging? Explain the basic steps that must be taken into account in designing a package.	**07**
Q.4	**(a)**	With the help of neat sketch, explain the design and application of Jib crane.	**07**
	(b)	Explain why Belt Conveyor has attained the dominant position in transporting bulk materials.	**07**
		OR	
Q.4	**(a)**	With the help of neat sketch, explain the design and application of EOT crane.	**07**
	(b)	Explain the methods of feeding to the Belt Conveyor and methods of Discharging from the Belt conveyor.	**07**
Q.5	**(a)**	What are the functions performed by Belt Conveyor Idler? Explain the following idlers in context of its construction, salient features and application: a) Impact Idler b) Flat carrying idler c) Transition Idler	**07**

(b) An incline conveyor handles an ore having density of 1.5 t/m^3. The material has to be conveyed over distance of 2 kms and height of 450 m. if belt speed is 120 m/min, then determine the standard width of four ply belt so that materials can be conveyed at a rate of 3 t/hr. Also determine the diameter and width of drive pulley and gear reduction ratio for motor, if motor speed is 1440 rpm. Assume the material for ply of belt has a material factor K_1=2.5 and belt tension and arc of contact factor K_2 = 80.pitch line velocity of belt is 2 m/s. **07**

Assume standard belt width as 300, 400, 450, 500, 600 ,650, 750, 800, 900, 1000, 1200, 1400 mm.

Conveyor inclination (degree)	Flowability factor
10-15	2.65 x 10^{-4}
16-20	2.50 x 10^{-4}
21-25	2.35 x 10^{-4}

OR

Q.5 **(a)** Explain the various stresses induced in steel wire ropes. Explain wire rope selection in detail. **07**

(b) Explain the different safety devices used in various Material Handling Equipment's. **07**

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