Seat No.: Enrolment No.
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## GUJARAT TECHNOLOGICAL UNIVERSITY

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

Su	bject	Code:730904 Date: 04/05/20	<b>17</b>	
Tiı	Subject Name: Design Of Material Handling Equipments Time:02:30 pm to 05:00 pm  Total Marks: 70			
Inst	2.	Attempt all questions.  Make suitable assumptions wherever necessary.  Figures to the right indicate full marks.		
<b>Q.1</b>	(a)	Discuss in details, the various factors to be considered in the selection of	07	
	(b)	Material Handling Equipments.  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>(b)</b>	Explain the importance of feeder in Belt conveyors. With the help of neat sketch, Explain the Mechanical Vibrating Feeder and Apron Feeder.  OR	07	
	<b>(b)</b>	Explain the stability analysis of movable crane used in the railway for loading and unloading wagon.	07	
Q.3	(a) (b)	Describe the step by step procedure for design of Bucket Elevator.  What are the different means for storing the bulk materials? Explain any three of them,	07 07	
Q.3	(a) (b)	OR 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. 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 07	
Q.4	(a) (b)	With the help of neat sketch, explain the design and application of Jib crane. Explain why Belt Conveyor has attained the dominant position in transporting bulk materials.	07 07	
Q.4	(a) (b)	OR  With the help of neat sketch, explain the design and application of EOT crane.  Explain the methods of feeding to the Belt Conveyor and methods of Discharging from the Belt conveyor.	07 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<sup>3</sup>. 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.

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 <sup>-4</sup>
16-20	2.50 x 10 <sup>-4</sup>
21-25	$2.35 \times 10^{-4}$

## OR

- Q.5 (a) Explain the various stresses induced in steel wire ropes. Explain wire rope of selection in detail.
  - (b) Explain the different safety devices used in various Material Handling 07 Equipment's.

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