

Seat No.: _____

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GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2018****Subject Code:2161401****Date:16/11/2018****Subject Name:Food Process Equipment Design****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) With the neat sketch of psychometric chart explain, “how the recirculation of air in a dryer affect its performance”? **03**
- (b) Differentiate: **04**
- (i) Pressure vessel and closed container
 - (ii) Thin and thick wall pressure vessel
- (c) Describe the classification of the agitators used in the food processing? **07**
- Q.2** (a) Explain the application of scrap surface evaporator in food industry? **03**
- (b) Write a note on Major and subsidiary loads on pressure vessel? **04**
- (c) Explain the need of safety factor in a pressure vessel? **02**
- Calculate the safe stress for high alloy stainless steel operated at 62°C with randomly checked lap joint and safety factor of 2.2. The material has allowable stress at 30 and 120°C as 190 and 120 N/mm² respectively. Lap joint efficiency and joint checking efficiency may be taken as 75% each. **05**
- OR**
- (c) What is LMTD? Where it is applicable? What is its significance? **07**
- Q.3** (a) Discuss possible material hazards in the dairy industry? How it can be checked? **03**
- (b) Compare single effect and multi effect evaporator? **04**
- (c) How the performance of the non-mixing type cross flow heat exchanger is calculated? **07**
- OR**
- Q.3** (a) Describe probable process hazards in the bakery industry? **03**
- (b) Explain the selection process of granular food product handling system? **04**
- (c) Discuss different type of paddle agitators, their use and limitations? **07**
- Q.4** (a) Why it is important to keep corrosion allowance during designing? **03**
- (b) Differentiate forward and backward feed system in a heat exchanger? **04**
- (c) What is the purpose of Chevron plate? Explain with sketch **07**
- OR**
- Q.4** (a) Explain the Duhring lines with neat sketch? **03**
- (b) With neat sketch explain the working of cone type agitators? **04**
- (c) With neat sketch explain LSU dryer and its time management? **07**

- Q.5** (a) What is Regeneration? **03**
(b) "In turbine agitator, high speed of agitator shaft leads improper mixing." Why? **04**
(c) What are the roles of baffles in agitator? What are its size limitations? **07**
- OR**
- Q.5** (a) What is significance of power number **03**
(b) With neat sketch explain PHE? **04**
(c) Explain the U- arrangement; Z- arrangement and 2x4/1x8 arrangements in plate heat exchanger with diagram? **07**

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