Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI • EXAMINATION – WINTER 2013

Subject Code: 161404 **Date: 06-12-2013**

Subject Name: Food Drying and Dehydration

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)** Explain drying and dehydration. Give importance of drying of agricultural produce. Describe natural sun drying process. **07**

(b) Determine the equilibrium moisture content of wheat at a temperature of 20^0C and relative humidity 60% using Henderson's equation. Given constant c and n are 1.6×10^{-5} and 2.0 respectively. **04**

(c) Calculate the amount of water removal from 10 tons of parboiled paddy having moisture content 40% (wb) during drying. The final moisture content of the dried paddy is 12% moisture content (db). **03**

Q.2 **(a)** Explain changes in quality parameters during drying of food. **07**

(b) What is equilibrium moisture content? How will you measure it? Explain moisture removal process from grain. **07**

OR

(b) Explain drying methods and drying rate periods. **07**

Q.3 **(a)** Explain basic steps in design of vacuum and tray dryer. **07**

(b) What are novel and hybrid technology of drying? Explain their requirement and advantages. **07**

OR

Q.3 **(a)** Explain the selection process of drier. **07**

(b) Write short notes (Any Two) **07**

i) PHTC dryer

ii) Tunnel drying

iii) LSU dryer

Q.4 **(a)** Define/ explain following terms (Any seven) **07**

i. Hysteresis ii. Shelf life

iii. Rehydration iv. Water activity

v. Deep bed vi. Convection

vii. Heat transfer coefficient viii. Constant drying rate

ix. Bound moisture

(b) Answer any two. **07**

i) Discuss testing of grain dryers.
ii) Describe flat bed type batch dryer
iii) Explain fluidized bed dryer with figure.

OR

Q.4 (a) Explain physical, chemical and biological characteristics of dehydrated foods. **07**

Q.4 (b) Explain various types of moisture present in food and drying rate curves. **07**

Q.5 (a) Answer the followings (Any Four) **08**

i) Explain the need to select dryer.
ii) Explain storage of grains
iii) What are types of heating methods in drying?
iv) List factors affecting drying.
v) What is freeze drying?

(b) Convert moisture content in dry basis to wet basis and wet basis to dry basis. **04**

i) 250% (db)
ii) 75% (db)
iii) 15% (wb)
iv) 40% (wb)

(c) Explain relative humidity measurement. **02**

OR

Q.5 (a) Explain design of any one grain dryer. **07**

(b) Give role of grain moisture content in storage. List methods of moisture measurements and explain any two methods. **07**

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