

Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY
Bachelor of Engineering - SEMESTER - V EXAMINATION - WINTER 2025

Subject Code: 3155104

Date: 27-11-2025

Subject Name: Post Harvest Engineering of Cereals, Pulses and Oil Seeds

Time: 10:30 AM TO 01:00 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.**

	Marks
Q.1 (a) Write the importance and objectives of Post Harvest Engineering of cereals, pulses, and oil-seeds.	03
(b) Define aspiration and explain its role in grain cleaning.	04
(c) A crusher requires 5 kWh for grinding a material at the rate of 100 kg/h from 2 cm size to 5 mm size. How much power will be required, if the reduction is 2 mm using 1 Rittinger's law and 2 Kick's law.	07
Q.2 (a) Discuss various types of separators used in grain cleaning.	03
(b) List and explain different types of forces used in size reduction of food grains with suitable examples.	04
(c) Sugar is ground from crystals of which it is acceptable that 80% passes a 500 μm sieve No. 35 to 88 μm No. 170 using a 5 HP motor. If the new product is 80% through 125 μm No. 120 sieve and throughput increased by 50%, check if the same motor suffices. Use Bond's law.	07
OR	
(c) What is sieve analysis? Mention its importance in post-harvest technology. Differentiate between scalping and grading in cleaning operations.	07
Q.3 (a) Draw the structure of a grain with neat, labeled diagram and explain the functions of all its parts.	03
(b) Define Mixing Index. Derive its formula and explain significance.	04
(c) Discuss the types of mixers used for solids, liquids, and pastes with neat diagrams.	07
OR	
(a) Write a short note on conditioning and parboiling of paddy.	03
(b) Explain the theory of mixing of solids and pastes with suitable examples.	04
(c) Explain traditional, CFTRI, Jadavpur, and Pressure parboiling methods in detail.	07
Q.4 (a) Define parboiling and state objectives and advantages.	03
(b) Explain the construction and working of rice milling plant with neat flow diagram.	04

- (c) Explain various size reduction laws Bond's, Kick's, and Rittinger's and discuss their applications in food grain processing with suitable examples. 07

OR

- (a) Differentiate between screw press and hydraulic press for oil extraction. 03
- (b) Explain the principle and factors affecting extrusion cooking. 04
- (c) With neat sketches, explain single-screw and twin-screw extruders. 07
- Q.5** (a) Explain oil extraction process from oilseeds using mechanical expeller with flow chart. 03
- (b) Describe solvent extraction and refining of edible oils. 04
- (c) Discuss various types of dryers used for grains e.g., batch, continuous, fluidized bed, and solar dryers. 07

OR

- (a) Explain the effect of drying on the nutritional and physical quality of cereals and pulses. 03
- (b) Describe packaging materials used for storage of cereals, pulses, and oilseeds and explain MAP Modified Atmosphere Packaging. 04
- (c) Discuss recent government schemes PM-FME, PMKSY and FPO initiatives for post-harvest infrastructure and farmer support. 07
