10. (a) What is the importance of conveying equipment? 4

(b) Write in details about Belt conveyor and Screw conveyor 10

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B.Tech Even Semester Examination, May, 2025

Agricultural Engineering

(4th Semester)

Course No: AGPC-256/AE-405

(Post-Harvest Operations)

Full Marks: 70
Pass Marks: 28
Time: 3 hours

Note:
1. Attempt any five questions taking one from each unit.
2. Begin each answer in a new page
3. Answer parts of a question at a place
4. Assume reasonable data wherever required
5. The figure in the right margin indicates full marks for the question
6. All the mathematical symbols and abbreviations have their usual meanings.

UNIT-I

1. i. Explain the working principle of air screen cleaner with suitable diagram. 8

   ii. Write down the difference between Cleaning Grading and Sorting 6

2. Define the following: 14(2x7)

   (i) angle of repose (ii) shape

   (iii) Aspect ratio (vi) Roundness

   (v) Sphericity (vi) Slender ratio

   (vii) angle of internal friction

UNIT-II

3. (a) Define the term Parboiling. 4

   (b) Explain the following: (a) CFTRI Parboiling (b) Pressure Parboiling 10(5+5)

4. (a) Write down the different factor affecting the changes of various properties during parboiling of paddy 7

   (b) Write down the advantages and disadvantages of the parboiling process 7

UNIT-III

5. (a) One tonne of dried grain at 10% moisture content (wb) is obtained from steam parboiled paddy grain of 35% (wb). How much will the weight of a steamed parboiled paddy be? 5

   (b) Define the term Drying. Write down the mechanism with neat diagram of falling rate drying. 9

6. Define the following: 14(2x7)

   (i) Dry bulb Temperature

   (ii) Bound MC

   (iii) Unbound MC

   (vi) Free MC

   (v) Hysteresis

   (vi) Constant rate drying

   (vii) Relative humidity

UNIT-IV

7. (a) Write down the difference between Ideal and actual screen 4

   (b) During evaluation of an air screen grain cleaner with 2 screens 200 g samples were collected to analyze clean seed fraction from different outlets. The data are presented in the table. Calculate the cleaning efficiency of the cleaner. 10

Sample fraction	Feed, g	Cleaning outlet, g	Blower outlet, g	Oversize outlet, g	Undersize outlet, g
Cleaned seed, g	185.25	196.5	1.75	3.5	3.0
Impurities, g	14.75	3.5	198.25	196.5	197.0

8. (a) Define the following termsi. Degree of milling iiAperture 8

   (b) A food material is milled from particle size of 5 mm to 0.0012 mm using 7 kW motor. What size motor will be required to reduce the same feed particle to product particle size of 0.0005 mm? Assume same feed rate and apply Rittinger's law. 6

UNIT-V

9. (a) What do you mean by law of size reduction? Explain in brief 6

   (b) In a wheat milling experiment it was found that to grind 4.33 mm sized grains to IS sieve 35 (0.351 mm opening), the power requirement was 8 KW. Calculate the power requirement for milling of wheat by the same mill to IS sieve 15 (0.157 mm opening) using (1) Rittinger's law and (2) Kick's law. Feed rate of milling is 200 kg/h. 8