

**MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION**

B.Tech. (Agril. Engg.)

Semester : IV (New)	Term : II	Academic Year : 2016-17
Course No. : APE 244	Title : Crop Process Engineering	
Credits : 3 (2+1)		
Day & Date : Monday, 08.05.2017	Time : 14.00 to 17.00	Total Marks : 80

- Note :**
1. Solve ANY EIGHT questions from SECTION "A".
 2. All questions from SECTION "B" are compulsory.
 3. All questions carry equal marks.
 4. Draw neat diagrams wherever necessary.

SECTION "A"

- Q.1 a) Enlist the different methods of preservation of fruits and vegetables.
b) Explain in brief about the processing of dried onion slices.
- Q.2 State the objectives of the parboiling of paddy and write the advantages and disadvantages of parboiling of paddy.
- Q.3 a) Draw the basic flow chart of rice processing in a modern mill.
b) Explain in brief the construction and working of rubber roll sheller.
- Q.4 a) Explain Rittinger's and Kick's Law.
b) In wheat milling experiment it was found that to grind 4.33 mm sized grain to IS sieve 35 (0.351mm opening), the power requirement was 8 kW. Calculate the power requirement for milling of wheat by same mill to IS sieve 15 (0.157mm opening) using 1) Rittinger's law and 2) Kick's law.
Feed rate of the milling is 200 kg / hr.
- Q.5 a) Draw the flow process chart for wet milling of pulses.
b) In pigeon pea milling experiment with concentric cylinder abrasive mill, the following observations were made. 1) Amount of unshelled grains = 2.5%, 2) Recovery of whole split kernels after milling = 71.4% , 3) Amount of powder generated = 11% , 4) Amount of crushed kernels = 3.6% , 5) Amount of husk removed = 11.5%. The cotyledon to grain ratio was 86.5%. Calculate the milling efficiency of the system.
- Q.6 a) Describe the methods used in size reduction machine.
b) Work out the values of fineness modules and average particle size from the following observations.

IS Sieve No.	100	70	50	40	30	20	15	Pan
Weight of material retained (g)	00	1.4	16.7	36.7	82.2	96.0	9.0	8.0

$F.M = 2.74 \quad D = 0.3174 \text{ mm}$

(P.T.O)

Q.7 Enlist the different material handling equipments. With the help of neat sketch explain the construction and working of bucket elevator.

Q.8 a) Explain in brief the construction and working of hammer mill with neat sketch.

b) A ball mill is used to grind the material in dry as well as wet (viscous) condition. Diameter of ball mill is 2 m. It is charged with 16 cm diameter balls. Calculate the critical speed and operating speed of rotation for 1) dry grinding and 2) wet grinding.

$$n_c = 31.18 \text{ rpm}$$

$$\text{Dry} = 24$$

$$\text{Wet} = 20$$

Q.9 Explain in brief different types of mixers used in food industry.

Q.10 Write short notes (Any Two).

- 1) Screen openings.
- 2) Pneumatic separator.
- 3) Process for preparation of banana powder.

SECTION "B"

Q.11 Fill in the blanks.

- 1) _____ is a process of removal of moisture from food to desired level.
- 2) Openings of screen are limited to 2 or more in an inch it is called _____.
- 3) Compartment type paddy separator have _____ power requirement.
- 4) _____ is a method of separating grain into two or more fractions according to size alone.
- 5) The material retained over a screen surface is called _____ material.
- 6) The edible portion of paddy is called _____.
- 7) _____ is the minimum clear space between the edges of the opening in the screening surface.
- 8) Screw conveyor requires relatively _____ power.

Q.12 Define the following terms.

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|-----------------------------|------------------------|
| 1) Degree of grinding | 2) Crushing efficiency |
| 3) Terminal velocity | 4) De-greening |
| 5) Cold pulping of tomatoes | 6) Work index |
| 7) Grading | 8) Belt conveyor |

