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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)

**B.Tech III Year I Semester Regular Examinations December-2021**

**AGRICULTURAL PROCESS ENGINEERING**

(Agricultural Engineering)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

**UNIT-I**

- 1 a Write the classification and importance of Physical & Mechanical properties of biological materials. **L1 6M**
- b List out and explain the Non Newtonian fluids with graphical representation. **L2 6M**

**OR**

- 2 a Define porosity. Explain the method for determination of porosity with neat sketch. **L2 8M**
- b Tank 2 of the apparatus is filled with a sample of dry shelled corn to a bulk density of  $752.86 \text{ kg/m}^3$ . The pressure readings were  $P_1=0.38\text{m}$  and  $P_3=0.26 \text{ m}$ . Find the porosity of the corn. **L3 4M**

**UNIT-II**

- 3 a Explain the role of aerodynamic properties in food processing. **L2 6M**
- b What is a drag coefficient? Draw the forces acting on a body immersed in fluid with suitable equations. **L3 6M**

**OR**

- 4 a Define terminal velocity and derive equation for terminal velocity of a particle with neat sketch. **L3 6M**
- b Find the terminal velocity of fat particle of  $6\mu\text{m}$  in diameter and density  $930 \text{ kg/m}^3$  in skim milk of  $1036 \text{ kg/m}^3$  density. The viscosity of the skim milk is  $0.00136 \text{ kg/ms}$ . How long it will take to cover a distance of  $15 \text{ cm}$ ? **L3 6M**

**UNIT-III**

- 5 a Define separation, cleaning, grading, sorting, scalping and screening. **L1 6M**
- b During the evaluation of an air screen grain cleaner with two screens the following data were observed. (i) The impurities present in feed were 6.5%, (ii) The impurities present in clean grain were 0.5%, (iii) The outflow of blower contained 0.2% clean seed, (iv) The overflow of 1st screen contained 1% clean seed and (v) The overflow contained 0.5% clean seed. Compute the cleaning efficiency of the cleaner. **L3 6M**

**OR**

- 6 a Explain disk separator with neat sketch. **L2 6M**
- b Explain the working principle of indented cylinder separation with neat sketch. **L2 6M**

**UNIT-IV**

- 7 a Explain present status, importance and scope of food processing. **L2 6M**
- b State Kicks and Rittingers laws for energy requirement with related equations. **L1 6M**

OR

- 8 a State Bonds laws for power requirement with related equation and define work index. L1 4M
- b In wheat milling experiment it as found that to grind 4.33mm sized grains to IS sieve 35 (0.351 mm opening). The power requirement was 8 KW, calculate the power requirement foe milling of wheat by the same mill to IS sieve 15 (0.157 mm opening) using 1) Rittingers law 2) Kicks law. Feed rate of milling is 200 kg/hr. L3 8M

## UNIT-V

- 9 a Explain parboiling. What are the main objectives of paddy parboiling and write the classification of parboiling methods. L2 6M
- b Write about the effect of parboiling on milling, nutritional and cooking qualities of paddy. L1 6M

OR

- 10 a Write the advantages and disadvantages of parboiling. L1 6M
- b Explain CFTRI method of parboiling. L2 6M

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