

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular & Supplementary Examinations February-2024
AGRICULTURAL PROCESS ENGINEERING
(Agricultural Engineering)

Time: 3 Hours**Max. Marks: 60**

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

UNIT-I

- 1 a Define rheology, Write the classification, importance and application of rheological properties. CO1 L1 6M
- b Explain the Toughness, Resilience and Stiffness with neat sketch. CO2 L2 6M

OR

- 2 List out the rheological models and derive Kelvin model with related equations. CO2 L3 12M

UNIT-II

- 3 a Explain the power losses due to friction with suitable equation. CO2 L2 6M
- b Assume that corn grains to be conveyed through a length of 10 feet and up 4 feet at a rate of 10 bushels per minute by means of a drag-chain conveyor. Coefficient of friction of the grain against steel at 7.3% and 19.3% moisture content are 0.46 and 0.56, respectively. The grain weighs 61.5 pounds per bushel when dry and 54.7 pounds per bushel when wet. Excluding the power required for running of the empty conveyor, determine the effect of moisture content on horse power requirement to lift the grain. CO2 L3 6M

OR

- 4 a Explain the role of aerodynamic properties in food processing. CO2 L2 6M
- b What is a drag coefficient? Draw the forces acting on a body immersed in fluid with suitable equations. CO2 L1 6M

UNIT-III

- 5 A cyclone separator having the following specifications is used to collect particles of specific gravity 1.2. Cyclone diameter=180 cm; Air inlet diameter=30 cm; Separating height= 2.5 of dia. of inlet; Helix pitch=15°; Inlet width=10 cm and entry particle velocity= 15 m/s. Compute the smallest particle which can be collected. Estimate the pressure drop through the unit. CO4 L3 12M

OR

6 a Explain ideal and actual screens and also explain different types of screens with neat sketch. CO4 L2 6M

b Explain rotary air screen cleaner with neat sketch. CO4 L2 6M

UNIT-IV

7 a 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 foR milling of wheat by the same mill to IS sieve 15 (0.157 mm opening) using i) Rittingerslaw ii) Kicks law. Feed rate of milling is 200 kg/hr. CO4 L3 6M

b State Bonds laws for power requirement with related equation and define work index. CO4 L1 6M

OR

8 a Define size reduction, principles of size reduction and what are the characteristics of comminute products. CO4 L1 6M

b Define fineness modules and crushing efficiency with related expression and what are the parameters for evaluation of performance of a size reduction machine. CO4 L1 6M

UNIT-V

9 a Explain parboiling, what are the main objectives of paddy parboiling and write the classification of parboiling methods. CO5 L2 6M

b Explain CFTRI method of parboiling. CO5 L2 6M

OR

10 Explain wet and dry milling of pulses with neat flow chart. CO5 L2 12M

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