



SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : APE (16AG704)

Course & Branch: B.Tech – AG

Year & Sem: III-B.Tech& I-Sem

Regulation: R16

UNIT-I

1. a. Explain principles and procedure of size reduction. **9M**
b. What is degree of grinding and Hulling efficiency? **3M**
2. Explain and Derive Kicks, Rittingers and Bonds laws. **12M**
3. a. Explain gyratory crusher with neat sketch. **6M**
b. Smooth roll crusher with neat sketch. **6M**
4. A roller crusher required 10 kW power to crush spherical grains of 25 mm diameter into 5 mm diameter particles at a feeding rate of 5 (a) If the coefficient of friction is 0.268, what should be the diameter of the rolls? (b) If the capacity is reduced to 2.5 kg/s and the particles diameter to 2.5 mm, what should be the power consumption? **12M**
5. a. Explains Jaw crusher with neat sketch. **6M**
b. Serrated crusher with neat sketch. **6M**
6. a. Explain working principle of Hammer mill with neat sketch. **10M**
b. What are the factor which affects the fineness of product. **2M**
7. a. Explain working principle of Ball mill with neat sketch. **8M**
b. Explain the roll crushers with neat sketch. **4M**
8. Explain working principle of colloid mill with neat sketch. **10M**
9. 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. **12M**
10. a) Explain working principle of Attrition mill with neat sketch. **8M**
b) What would be the operating speed of rotations per minute of ball mill of 2000 mm diameter charged with 100 mm balls? Ball mill grinding solid matter. **4M**

UNIT-II

1. Derive a general expression for the terminal velocity. **12M**
2. Pineapple fibers are settling in its juice due to gravity. The fiber particles are of 100 micrometer diameter having a mass density of 1065 kg-m⁻³. The density and viscosity of juice are 1020 kg m⁻³ and 0.5 cP, respectively. Calculate terminal velocity of the fiber. **12M**
3. What is drag coefficient? Illustrate forces acting on body immersed in fluid. **12M**
4. Explain different types of paddle mixers with neat sketch. **12M**
5. Explain different types of Propeller Mixer with neat sketch. **12M**
6. a. Explain Pan (Bowl, Can) Mixers with neat sketch. **9M**
b. list out equipment's used in high viscosity liquid mixers. **3M**
7. a. Explain Tumbling Mixers with neat sketch. **10M**
b. list out equipment's of dry powder mixers. **2M**
8. a. Explain application of mixers in food industry. **8M**
b. Explain frictional drag and profile drag. **4M**
9. Drive a general expression for mixing time. **12M**
10. Biscuit dough is prepared by mixing wheat flour and other ingredient along with tracer material (2% of the mass) after 10 min of mixing. The efficiency of the mixing as enhanced by analyzing sample randomly taken 6 dough spot. The analysis for the tracer ingredient is 2.02%, 1.928%, 1.826%, 2.125%, and 2.20% 2.0125%. **12M**

UNIT III

1. Explain Design consideration of an air-screen grain cleaner with neat sketch. **12M**
2. A screen is used to separate two components (A and B) from a feed where F, O and U are taken as mass flow rates of feed, overflow and underflow streams, respectively. The corresponding mass fraction of the oversize component A in these streams is XF, Xo and Xu. Derive an expression for overall effectiveness of this screen. **12M**
3. In sieve analysis of corn grits with respect to any particular screen opening the mass fraction of desired particle size in feed, overflow and underflow stream are 0.47, 0.85 and 0.20 respectively. The feed rate of the material on the screen is 10 kg/hr. a) calculate mass flow rate for the overflow b) overall effectiveness of the screen. **12M**
4. a. Explain working principle specific gravity separator. **8M**
b. Explain the adjustment in specific gravity separator. **4M**
5. a. Explain working principle of cyclone separator with neat sketch. **8M**
b. What are the adjustments in indented cylinder? **4M**
6. a. Explain Ideal and Actual screens. **6M**
b. Explain different types of screens with neat sketch. **6M**
7. Explain rotary air screen cleaner with neat sketch. **12M**
8. a. Explain different moisture content measurement methods. **9M**
b. Explain hysteresis curve. **3M**
9. Determine the values of constants of c and n from the Handerson's equation for the following data obtained under two different conditions of EMC studies of sunflowers seed. **12M**

Condition	Relative humidity, %	Temperature °C	EMC, % (db)
1.	50	40	10
2.	70	50	13

10. a. Explain Bound, Unbound and Free moisture show it in graph. **8M**
b. Write importance of EMC. **4M**

Unit IV

1. a. Explain drying curves. **4M**
b. LSU dryer with neat sketch. **8M**
2. a. Explain Fluidized bed. **6M**
b. Flatbed dryer with neat sketch. **6M**
3. a. Draw flow chart of rice milling and write use each equipment's in milling operation. **10M**
b. List out parboiling methods. **2M**
4. Write advantage and disadvantage of parboiling. **12M**
5. a. Explain rubber roll Sheller with neat sketch. **9M**
b. Explain effect of parboiling on milling. **3M**
6. Explain vertical whitening cone with neat sketch. **12M**
7. a. Explain important unit operations in pulse milling. **8M**
b. List out factors affecting on pulse milling outturn. **4M**
8. Explain screw press type oil expression with neat sketch. **12M**
9. a. Draw flow chart of dry milling method. **10M**
b. Explain effect of parboiling on nutritional qualities. **2M**
10. a. Explain rotary filter with neat sketch. **10M**
b. What is difference between hulling and shelling. **2M**

Unit V

1. What are the importance's of material handling equipment's. 12M
2. a. Explain principle of operation of Belt conveyor with neat sketch. 10M
 b. List out components of belt conveyor. 2M
3. Explain principle of operation of Screw conveyor with neat sketch. 12M
4. a. What are the classifications of Bucket elevator? 2M
 b. Explain principle of operation of Bucket elevator with neat sketch. 10M
5. a. Explain principle of operation of pneumatic conveyor with neat sketch. 10M
 b. what are the limitations pneumatic conveying system. 2M
6. A 5 m long screw conveyor with 30 cm screw diameter, 15 cm shaft diameter and 28 cm screw pitch rotates at 300 rpm. Calculate the delivery capacity of this screw conveyor (m³/h) if the actual capacity is 50 % of the theoretical capacity. Also calculate the actual power required for transportation of wheat (bulk density 770 kg/m³). If the material factor is 0.4 and power transmission efficiency is 50 %. 12M
7. A horizontal screw conveyor of length 2 m conveys wheat grain having bulk density of 680 kg/m³. The screw diameter, shaft diameter and pitch of the screw are 0.5 m, 0.3m and 0.45m respectively. If the screw is completely filled with the grain and rotates at 60 rpm, calculate the capacity of the screw conveyor. 12M
8. a. Explain Belt conveyor idlers, idler spacing and Belt tension. 8M
 b. write formulas of capacity and power of bucket elevator. 4M
9. Explain Bucket elevator discharge methods with neat sketch. 8M
 b. write formulas of capacity and power of Belt conveyor. 4M
10. a. Explain chain conveyor. 6M
 b. Explain gravity conveyor. 6M

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