

AE 569 - Exam 1

Part 1 Closed Book

Name _____

Multiple Choice: 2 pts each

1. The contribution of bacteria to grain deterioration is
 - a) never of importance.
 - b) not really understood.
 - c) always the most important of any agent.
 - d) seldom of importance.

2. Different grains have different safe storage moisture contents because
 - a) different grains will have different bulk densities.
 - b) grains with thick seed coats tend to be more resistant to attack.
 - c) tradition among grain people has established values for different grains.
 - d) grains vary in equilibrium moisture content for 65% RH air.

3. At the end of the Allowable Storage Time, corn will have, on the average
 - a) lost 1/2% of dry matter
 - b) lowered one commercial grade number
 - c) produced 7.4 grams of carbon dioxide per kilogram of original dry matter
 - d) all of the above
 - e) none of the above

4. What limits column thickness in a batch or continuous-flow dryer having a cross flow configuration?
 - a) drying capacity
 - b) airflow rate
 - c) moisture content variation at end of drying
 - d) drying efficiency
 - e) none of the above

5. Which continuous-flow dryer type most often represents continuous-flow dryers in cylindrical bins?
 - a) counterflow
 - b) concurrent flow
 - c) crossflow
 - d) all three types are often found as bin dryers.
6. Of the continuous-flow dryer types, this one has the highest fuel efficiency:
 - a) concurrent flow
 - b) crossflow
 - c) counterflow
 - d) they all have about the same fuel efficiency.
7. An in-storage natural air dryer is operating with 10 ft of grain in the bin; increasing grain depth to 15 ft will
 - a) decrease drying rate.
 - b) increase drying rate.
 - c) have no effect on drying rate.
8. A stirring machine has what effect on the Allowable Storage Time of grain in a drying bin.
 - a) increase
 - b) decrease
 - c) has no effect
 - d) cannot tell from information given.
9. At the completion of drying which of these dryer types has the highest average kernel temperature, given the same drying air temperature?
 - a) concurrent flow
 - b) crossflow
 - c) counterflow
 - d) all have about the same average kernel temperature.
10. The suspended overhead floor batch dryer (roof dryer) overcomes this disadvantage of a conventional bin-batch dryer:
 - a) too much moisture variation across grain depth.
 - b) time lost unloading the batch.
 - c) no wet grain holding.
 - d) small batch size.
11. Increasing bin diameter for a constant depth of grain with the same fan will have what effect on the static pressure at the plenum?
 - a) decrease
 - b) no effect
 - c) increase

- d) cannot determine from this information only.
12. Air is being forced through a layer of grain 10 feet deep. The pressure in the plenum is 5 in H₂O. The pressure at a point in the grain 2 feet above the floor will be
- a) 0 in H₂O
 - b) 10 in H₂O
 - c) 4 in H₂O
 - d) 1 in H₂O
13. Soybean hulls are removed before oil extraction because
- a) they're more valuable for use as a dietary supplement
 - b) they loosen and clog the system
 - c) they don't have enough oil to merit processing
 - d) it is a tradition in the industry
14. In the solvent extraction process, the first solvent to which the beans are exposed to is
- a) soybean oil.
 - b) fresh hexane.
 - c) half miscella.
 - d) nearly full miscella.
15. The main advantage of the solvent extraction process over other oil extraction processes is
- a) higher oil recovery.
 - b) less solvent loss.
 - c) higher quality meal.
 - d) less energy use.

- (30) 17. A 24-ft diameter bin contains 15 ft of wet spreader placed corn which has been stirred. The bin is fitted with a Rolfes 28-in 10-hp axial fan. Compute the cfm/bu delivered by the fan.

- (25) 18. A bin contains 600,000 lb of 25% moisture corn. The bin is equipped with a biodryer which uses heat from respiration of fungi to dry the corn in the bin. If it takes 2000 Btu to evaporate each lb of water, what is the corn moisture content when 7% of the original dry matter has been consumed?