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Question Paper Code: 53102

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Third Semester

Agricultural Engineering

15UAG302 - UNIT OPERATIONS IN AGRICULTURAL PROCESSING

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. It is proposed to concentrate orange juice by boiling – off excess water. The relevant operation in this process is known as
 - (a) Distillation
 - (b) drying
 - (c) evaporation
 - (d) Crystallisation
2. In a single effect evaporator, the economy is
 - (a) Equal to 1
 - (b) Greater than 1
 - (c) Less than 1
 - (d) Less than or equal to 1
3. Stoke' law is used to find out
 - (a) Terminal velocity
 - (b) Surface tension
 - (c) Drag coefficient
 - (d) Specific gravity
4. Sedimentation of solid particles occurs in
 - (a) Spray dryer
 - (b) Tray dryer
 - (c) Solar dryer
 - (d) None of these
5. In size reduction of fine powders, which of the following laws is more applicable
 - (a) Kick's law
 - (b) Rittinger's law
 - (c) Bond's law
 - (d) All the above
6. For size reduction, the following methods are used
 - (a) Cutting
 - (b) Crushing
 - (c) Compression
 - (d) All the above

7. Contact equilibrium separation processes are
- | | |
|---------------------|------------------|
| (a) Crystallisation | (b) Distillation |
| (c) Both a and b | (d) Drying |
8. Rate of absorption is
- | | |
|---------------------------------------|--------------------------------|
| (a) Driving force/ Resistance | (b) Resistance/ Driving force |
| (c) Driving force \times Resistance | (d) Driving force + Resistance |
9. Crystallisation is a separation of
- | | |
|---------------------|-------------------|
| (a) Liquid - liquid | (b) Solid - solid |
| (c) Solid - Liquid | (d) Liquid - gas |
10. In attrition mill the size of food grains is reduced by
- | | |
|-------------------------|----------------------|
| (a) Shear and crushing | (b) Impact and shear |
| (c) Impact and crushing | (d) Impact |

PART - B (5 x 2 = 10 Marks)

11. What is meant by boiling point elevation?
12. What are the basic requirements of filtration equipments?
13. Define crushing efficiency.
14. List the factors controlling the extraction operation.
15. Write a note on vacuum distillation.

PART - C (5 x 16 = 80 Marks)

16. (a) What are the unit operations in food processing? Briefly explain the operations. (16)

Or

- (b) Explain in detail about the performance and working principle of falling film, forced circulation and agitated film evaporator. (16)
17. (a) (i) Write in detail about the constant rate and constant pressure filtration. (8)
- (ii) Explain the working principle of rotary vacuum filter and filter press. (8)

Or

- (b) Explain about centrifuge equipment in detail. (16)

18. (a) What is size reduction? Explain the principle and characteristics of comminuted characteristics with its energy and power requirement. (16)

Or

(b) Explain the construction and operation of jaw crusher and attrition mill. (16)

19. (a) What is contact equilibrium separation process? Explain the concentration of gas liquid and solid liquid equilibrium. (16)

Or

(b) What are extraction and washing equipments? (16)

20. (a) Write in detail about the classification of crystallizers and their working. (16)

Or

(b) Write in detail about the vacuum distillation. Also explain the various factors affecting the distillation operation. (16)
