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Question Paper Code: U3A02

B.E./B.Tech. DEGREE EXAMINATION, NOV 2023

Third Semester

Agriculture Engineering

21UAG302– UNIT OPERATIONS IN AGRICULTURAL PROCESSING

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- In evaporators, which of the following modes of heat transfer will takes place CO1- U
 - Conduction and convection
 - Conduction and radiation
 - Radiation and convection
 - Conduction, convection & radiation
- _____ are the functional sections present in evaporator. CO1- U
 - Heat exchanger & evaporating section
 - Heat exchanger & separator
 - Separator & evaporating section
 - Heat exchanger, evaporating & separator
- Membrane filters are made up of _____ CO1- U
 - Cellulose acetate
 - Resins
 - Positively charge ions
 - Negatively charge ions
- Settling velocity of a spherical body in a viscous fluid is given CO1- U
by _____
 - Reynolds law
 - Newton's law
 - Stokes law
 - Charles law
- Which of the following is a size reduction unit operation in liquid CO1- U
 - Milling
 - Grinding
 - Mixing
 - Homogenization
- shear force is _____ CO1- U
 - Force acting in direction parallel to surface of a body
 - Force acting in direction perpendicular to surface of a body
 - Force acting in direction longitudinal to surface of a body
 - Force acting in direction vertical to surface of a body

7. The force used for mixing by mixing equipment is _____ CO1- U
 (a) Centrifugal smearing (b) Impact (c) Tumbling (d) All of the above
8. The principle of mixing is _____ CO1- U
 (a) Shear force (b) Perpendicular force
 (c) Gravitational force (d) Centrifugal force
9. Crystallizer is used for _____ CO1- U
 (a) Liquid-solid separation (b) Solid separation
 (c) Liquid – liquid separation (d) Gas – solid separation
10. The name of the unwanted crystals in draft tube baffle crystallizers is _____ CO1- U

 (a) Fines (b) Powder (c) Soap (d) Low quality crystals

PART – B (5 x 2= 10Marks)

11. Define law of conservation of mass with suitable example CO1- U
12. Draw schematic diagram of plate and filter press method of filtration. CO1- U
13. State Bond's law of size reduction CO1- U
14. Explain in briefly about the working principle of triple roller mill CO1- U
15. List out the parameters that affect the rate of crystal growth. CO1- U

PART – C (5 x 16= 80Marks)

16. (a) Classify evaporators and explain the natural circulation evaporator with suitable diagram. CO1- U (16)
 Or
 (b) Illustrate the construction and working principle of long tube evaporators. CO1- U (16)
17. (a) Explain filtration technique and working principle of Continuous pressure or vacuum filter with neat sketches. CO1- U (16)
 Or
 (b) Explain about the gravity separator and Centrifugal separation. CO1- U (16)
18. (a) With suitable diagram describe the working principle of ball mill. CO1- U (16)
 Or
 (b) Recognize the rolling compression mill working principle and its construction. CO1- U (16)

19. (a) Explain Mixing and discuss in detail about the objectives and factors affecting the process of Mixing. CO1- U (16)
- Or
- (b) Explain the construction and working principle of silver son emulsifier with neat sketches CO1- U (16)
20. (a) Infer the construction and working principle of flash distillation process with neat sketches. CO1- U (16)
- Or
- (b) Discuss in detail about the construction and working of continuous distillation with neat sketch CO1- U (16)

