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Question Paper Code: U7A02

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2025

Seventh Semester

Agricultural Engineering

21UAG702 – CROP PROCESS ENGINEERING

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Which factor affects the power requirement in mixing operations? CO1- U
(a) Container color (b) Type of packaging used
(c) Viscosity of the material being mixed (d) Age of the material
2. Which of the following best describes the primary objective of food processing? CO1 - U
(a) Increasing crop yield (b) Reducing post-harvest losses
(c) Improving irrigation systems (d) Enhancing soil fertility
3. The main method used for processing oilseeds is: CO1 - U
(a) Boiling (b) Cold storage (c) Oil extraction (d) Filtration
4. Which of the following best describes a cutting machine in size reduction? CO1 - U
(a) Breaks material by impact (b) Shears material using sharp blades
(c) Compresses material until it breaks (d) Uses heat to melt material
5. Which type of mixer is generally used for sticky or paste materials? CO1 - U
(a) Ribbon blender (b) Planetary mixer (c) Hammer mill (d) Air classifier
6. Which of the following is a characteristic of mixing dry solids? CO1 - U
(a) Requires very high pressure (b) Often results in particle size increase
(c) Depends on particle size, shape, and density (d) Always requires heating

7. What is the main purpose of separation in food processing? CO1 - U
- (a) To change chemical properties of materials
- (b) To combine two materials into one
- (c) To isolate desired components based on physical properties
- (d) To color food uniformly
8. The effectiveness of a screen refers to: CO1 - U
- (a) Its weight (b) Its ability to withstand heat
- (c) Its efficiency in separating particles correctly (d) Its material composition
9. A screw conveyor is most suitable for moving: CO1 - U
- (a) Liquids over long distances (b) Very light gases
- (c) Free-flowing granular or powdery materials (d) Delicate fruits
10. Pneumatic conveying is best suited for: CO1 - U
- (a) Heavy solid blocks (b) Sticky pastes
- (c) Fine powders and light particles (d) Liquids

PART – B (5 x 2= 10 Marks)

11. Describe any two principles commonly followed in food preservation. CO1 - U
12. Differentiate between crushers and grinders with suitable examples. CO1 - U
13. Explain the theory of mixing in the context of agricultural processing. CO1 - U
14. Apply sieve analysis results to determine the average particle size of a grain sample. CO2-App
15. Select a suitable material handling system for transporting granular fertilizer over a short horizontal distance and justify your choice. CO5-App

PART – C (5 x 16= 80 Marks)

16. (a) As the newly appointed production manager at a rice milling facility planning to start parboiled rice processing, explain the main stages involved in parboiling paddy rice. how Additionally, describe how you would maintain high quality and maximize efficiency at each stage. Provide specific management strategies to effectively control and optimize each step of the process. CO2 – App (16)

Or

- (b) Design a small-scale food processing unit suitable for rural entrepreneurship to process cereals and pulses. Your design should include a clear process flow, required equipment at each stage, and the expected output. Consider factors like scalability, affordability, and local resource availability in your model. CO2 – App (16)
17. (a) Explain the details about the roller mill with a neat sketch. Advantages and disadvantages. CO1 - U (16)
- Or
- (b) Explain the Procedures, properties, and laws of size reduction. CO1 - U (16)
18. (a) Explain the theory of mixing with the mixing rate and mixing index. CO1 - U (16)
- Or
- (b) Explain in detail about liquid mixer with comparison. CO1 - U (16)
19. (a) The food processing industry is facing problems in achieving accurate size separation of grains. As a process engineer, evaluate suitable screening and separation equipment, justifying your choice. CO4 - Ana (16)
- Or
- (b) A food processing industry wants to separate a mixture of grains of different sizes. Design a separation strategy using suitable screens and separators. Justify your choice. CO4 - Ana (16)
20. (a) Define material handling in agricultural processing, and list at least three types of equipment used. CO1 - U (16)
- Or
- (b) Explain in detail about the Groundnut decorticator with a neat sketch, and discuss the pros and cons. CO1 - U (16)

