A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 53A02

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

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 CO1- R

   (a) Distillation (b) drying (c) evaporation (d) Crystallisation

2. In evaporation the exact rise in boiling point is given by CO1- R

   (a) Boyle's law (b) Charles law (c) Roult's law (d) Duhring's law

3. Filtration is a process for separating CO2- R

   (a) Soluble solids from liquids (b) Insoluble solids from liquids

   (c) Immiscible liquids from liquids (d) None of the above

4. Stoke's law is used to find out: CO2- R

   (a) Specific gravity (b) Drag coefficient (c) Surface tension (d)Terminal Velocity

5. Size reduction increases the CO3- R

   (a) Surface area (b) Particle size (c) Reduced particle size (d)Increases volume

6. According to which law, the energy required for size reduction is proportional to the change in surface area CO3- R

(a) Kick's law (b) Rittinger's law (c) Bond's law (d) All the above

7. A group of separation operations which are used in food processing can be called _____ separations. CO4- R

(a) Mechanical (b) Physical (c) Contact equilibrium separation (d) Centrifugal

8. Rate of extraction is given by CO4- R

(a) Driving force x resistance (b) Driving force / resistance

(c) Resistance / driving force (d) None of these

9. Crystallisation is a separation of CO5- R

(a) Liquid - liquid (b) Solild - solid (c) Solid - Liquid (d) Liquid - gas

10. _____is a separation process, separating components in a mixture by making use of the fact that some components vaporize more readily than others. CO5 -R

(a) Crystallization (b) Distillation (c) Evaporation (d) None of these

PART – B (5 x 2= 10Marks)

11. What is meant by boiling point elevation? CO1- R

12. Define sedimentation process CO2- R

13. State Rittinger's law with equation? CO3- R

14. List the properties of tower packing? CO4- R

15. Describe vacuum distillation. CO5- R

PART – C (5 x 16= 80Marks)

16.	(a)	What are the unit operations in food processing? Briefly explain the operations.	CO1- App	(16)
		Or		
	(b)	Explain in detail about the performance and working principle of falling film, forced circulation and agitated film evaporator.	CO1 -App	(16)
17.	(a)	Show the working of disc-bowl and liquid – solid centrifuges with neat sketch.	CO2 -App	(16)
		Or		
	(b)	Explain the different types of filtration equipment and its application in food processing.	CO2 -Ana	(16)
18.	(a)	Explain in detail about types of grinders with neat sketch	CO3- Ana	(16)
		Or		
	(b)	Explain in detail about all types of crushers used in agricultural operations with neat sketch	CO3 -Ana	(16)
19.	(a)	Summaries about types of packed extraction towers?	CO4- U	(16)
		Or		
	(b)	Explain in detail about types of equipment for leaching with neat sketch	CO4 -Ana	(16)
20.	(a)	Discuss about types of crystallization equipment with neat sketch.	CO5- U	(16)
		Or		
	(b)	Write in detail about the vacuum distillation. Also explain the various factors affecting the distillation operation.	CO5- U	(16)