15/10/25

TM24S302T

Reg. No :.....

Name :.....

MASTER'S DEGREE (C.S.S) EXAMINATION, OCTOBER 2025

2024 ADMISSIONS REGULAR

SEMESTER III - GENERAL

VFPT3G07TM20 - Food Process Engineering

Time : 3 Hours

Maximum Weight : 30

Part A

I. Answer any Eight questions. Each question carries 1 weight (8x1=8)

1. State the gas law relating volume and temperature with the derivation of its equation.
2. A solution of glucose ($C_6H_{12}O_6$)in water is labeled as 10 % (w/w). Calculate molality and molarity of the solution. Given the density of the solution is 1.20 g mL^{-1} and molar mass of glucose is 180 g mol^{-1}.
3. Comment on use of pumps in liquid transport system with example.
4. Cite the various types of pumps used in food plants.
5. Point out the relevance of F, D and z values in food processing.
6. State the theory of heat transfer.
7. List the application of various freezing systems used in food industry.
8. Classify refrigerants based on the chemical composition.
9. Point out the difference between reverse osmosis and ultrafiltration.
10. Recall the term centrifugation in food industry.

Part B

II. Answer any Six questions. Each question carries 2 weight (6x2=12)

11. Explain the purpose of material balance calculation in food processing industries.
12. Derive the continuity equation for fluid flow.
13. Describe the method for measurement of turbulent flow and streamline flow of fluids.
14. Derive the equation for heat conduction through a cylindrical wall.
15. Explain the thermal processing of evaporation.
16. Explain the principles of refrigeration.
17. List the desirable properties of a refrigerant.
18. Illustrate the different equipments used for size reduction in a food industry.

Part C

III. Answer any Two questions. Each question carries 5 weight (2x5=10)

19. Derive Bernoulli's equation for conservation of energy in fluid flow.
20. Derive the equation for heat conduction through (a) Slab (b) Cylindrical wall
21. Discuss the working of components in a refrigeration cycle.
22. Describe the various types of filtration equipments used in food industries.