KERALA AGRICULTURAL UNIVERSITY
B.Tech.(Agrl. Engg.) 2018 Admission
VI Semester Final Examination- December 2021

Fape.3207 **Dairy and Food Engineering (2+1)** **Marks: 50**
Time: 2 hours

I **Fill in the blanks** **(10x1=10)**

1. The steam consumption to water evaporation ratio in drum dryer is ----------
2. Kg of steam / kg of water vapour removed in an evaporator is called ----------
3. Permeate from reverse osmosis membrane consists of ----------
4. ---------- is used as the heating medium for drying milk in a spray dryer
5. Time-temperature combination in HTST pasteurizer is ----------
6. The operating pressure in nano filtration ranges from ----------
7. Stoke's law states that efficiency of separation varies at the square of ------- and inversely as the ----------.
8. Pressure required in the first stage of two stage homogenization is ----------
9. The operation usually carried out by chemical agents or by heat which destroy pathogen or other harmful microorganism but not ordinarily bacterial spores are called ----------
10. For concentrating milk commonly employed evaporator system is ----------

II **Write short notes on ANY FIVE of the following** **(5x2=10)**

1. Ultra filtration
2. Vacreation
3. Batch sterilization
4. Fouling of heat exchanger
5. Homogenization
6. Centrifugation
7. Functions of atomiser in a spray drier

III **Answer ANY FIVE of the following** **(5x4=20)**

1. Write a note on Reverse osmosis
2. Enumerate the principle of filtration? Add a note on their types and how will you calculate the rate of filtration
3. Explain freeze drying of food
4. Write a note on centrifugal separation
5. Explain cleaning in place and its types
6. Explain the different feeding arrangements in drum driers
7. Explain method of pasteurization

IV **Write an essay on ANY ONE of the following** **(1x10=10)**

1. With the help of neat relevant diagram explain the construction and operation of spray dryer.

2. Milk is concentrated from 17 to 52 % solids in vacuum pan. Steam is applied at 85^0C and a vacuum of 66 cm of Hg is maintained inside the vacuum pan. The feed to vacuum pan is 8000kg/hr at 25^0C. The condensate leaves at the condensing temperature and the product is assumed to have negligible elevation of boiling point. The specific heat of feed and product is 3.9 KJ/kg^{0}C and 3.5 KJ/kg^{0}C. Overall heat transfer coefficient is 2300 W/m^2 ^{0}C . Estimate the steam consumed? Steam economy? And the heating surface area required?

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