KERALA AGRICULTURAL UNIVERSITY
B.Tech.(Food Technology) 2020 Admission
III Semester Final Examination – March 2022

Pafe.2116 **Fundamental Unit Operations in Food Processing (2+1)** **Marks: 50**
Time: 2 hours

I ~~**Fill in the blanks**~~ T/F **(10x1=10)**

1. Screens separate the particles according to size alone.
2. Rittinger's law is based on stress analysis of plastic deformation within the elastic limit.
3. The power requirement to operate dough and paste mixers is low.
4. Rate of filtration increases with increase in thickness of filter cake.
5. Reverse osmosis is widely used for purification of water.
6. If the exchanging ions are positively charged, the ion exchanger is termed cationic, and anionic if they are negatively charged.
7. Centrifugation can be used to separate two liquid components with different densities.
8. Size reduction decreases the surface area.
9. Ultra filtration is also known as hyper-filtration.
10. In hammer mill, disintegration is caused by shear and impact forces.

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

1. Write the benefits of size reduction.
2. Define 'mixing' and 'mixing index'.
3. State Rittinger's and Kick's laws of size reduction.
4. Differentiate between osmosis and reverse osmosis.
5. What do you mean by membrane fouling? Write its types.
6. Define the terms 'fineness modulus' and 'uniformity index'.
7. What is 'extrusion cooking'?

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

1. Describe various methods of size reduction with suitable examples.
2. In a particular mixing operation, the mixing rate constant has been found out as 1.5×10^{-4} s^{-1}. What will be the mixing index after 30 minutes of operation?
3. Discuss about the liquid mixing and its power requirement.
4. What is membrane separation? Write its principle of operation.
5. Define electro-dialysis. Write its applications.
6. The 80% of feed passes through 3.250 mm opening (IS sieve no. 340) and 80% of the product passes through 0.420 mm opening (IS sieve no. 40). The work index of the material is 6.50. Calculate the power requirement to crush 1 tonne/hour of a material using Bond's law.
7. Write short notes on colloid mill.

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

1. Define 'filtration' and 'rate of filtration'. Describe in brief about plate and frame filter press with figure.
2. Write a short note on jaw crusher. Briefly explain the hammer mill with the help of a labelled diagram.

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