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Roll No. ....

**AA-801**

**M. Tech. EXAMINATION, May 2017**

(First Semester)

(B. Scheme) (Re-appear Only)

FT-501

FOOD TECHNOLOGY

Principles of Food Engineering

*Time : 3 Hours]*

*[Maximum Marks : 75*

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Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

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**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

(3-05/9) M-AA-801

**P.T.O.**

### **Unit I**

1. (a) What is material and energy balance ?  
(b) Calculate the specific heat of beef roast containing 15% Protein, 20% Fat and 65% Water in terms of BTU and S.I. units.
2. (a) Explain involvement of material balance in dilution and dehydration process with suitable examples.  
(b) Draw a diagram and set up equations representing total mass balance and component mass balance for system involving the mixing of pork (15% protein, 20% fat and 63% water) and backfat (15% water, 80% fat and 3% protein) to make 100 kg of a mixture containing 25% fat.

### **Unit II**

3. Write short notes on the following :
  - (a) Newtonian and Non-Newtonian fluids
  - (b) Streamline and Turbulant flow.

4. What are the importance of pumps and pipelines in liquid transport system ? Discuss in brief the different kind of pumps used in food processing plants.

### **Unit III**

5. Discuss different modes of heat transfer. How conductive heat transfer coefficient is estimated for multilayered systems ?
6. What are the heat exchangers used in different food industries ? Describe tubular and steam infusion heat exchanges in detail.

### **Unit IV**

7. Define the following with suitable examples :
  - (a) Thermal inactivation of micro-organisms
  - (b) D value
  - (c) Z value.
8. Define the following terms :
  - (a) Wet bulb temperature
  - (b) Dew point temperature
  - (c) Psychrometric chart.