75 : TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2069 Ashad

Exam.	New Back (2066 & Later Batches)		
Level	BE	Full Marks	40
Programme	B. Agri.	Pass Marks	16
Year / Part	III / I	Time	1½ hrs.

Subject: - Engineering Properties of Bio-Material *(AE 602)*

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ *Attempt any <u>Four</u> questions.*
- ✓ *The figures in the margin indicate <u>Full Marks</u>.*
- ✓ *Assume suitable data if necessary.*

1. a) Define the term Chroma and Gloss. Explain the significance of engineering properties of Bio-materials in food engineering. [2+3]

   b) Define food Rheology. Calculate the sphericity of a cylindrical object of diameter 1.0cm and height 1.7cm. [1+4]

2. a) What do you mean by TQM? Why is toulene used is pycnometer test of specefic gravity of bio-materials? [2+3]

   b) What do you mean by Heat of Respiration? It is proposed that an air stream be used to separate wheat kernels having terminal velocity of 9.7m/s from O at kernels having terminal velocity of 8.3m/s. What air velocity would you choose? What factor would affect the degree of seperation achieved? [1+4]

3. a) What do you mean by GMPs? The thermal conductivity of an apple is measured at 25°C by Guarded hot plate method. The apple samples are cut into chips with area of 305mm×305mm and thickness of 10mm. The temperature difference between the hot and cold surfaces is kept at 3°C and the measured rate of heat input is 7W. Calculate the thermal conductivity of the apple. [2+3]

   b) Explain the process of electrical heating of food materials. Define the term stress relaxation in food Rheology. [3+2]

4. a) Define Criterion Area. What are the different rheological models for different types of fluid foods? Explain. [1+4]

   b) What are the applications of electrical properties? Explain the objectives of quality control in food industries. [2+3]

5. Write short notes on: [2.5×4]

   a) HACCP
   b) Rheopectic and Thixotropic foods
   c) DLE sorting
   d) Specific gravity gradient tube

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