



**KERALA AGRICULTURAL UNIVERSITY**  
**B.Tech.(Food Engg) 2018 Admission**  
**II Semester Final Examination- June 2019**

Fden.1201

**Engineering Properties of Biological Materials (2+1)**

**Marks: 50**  
**Time: 2 hours**  
**(10x1=10)**

**I Fill up the blanks**

- 1 The pure plastic behaviour material is also called \_\_\_\_\_
- 2 Texture applies to \_\_\_\_\_ food and viscosity applies to \_\_\_\_\_ food
- 3 \_\_\_\_\_ is a science which deals with deformation and flow of material under the action of applied force
- 4 Mechanical model for determination of visco-elastic behaviour contains \_\_\_\_\_ and \_\_\_\_\_
- 5 The capacity of a material for taking permanent deformation is known as \_\_\_\_\_
- 6 The resistance to applied force is known as \_\_\_\_\_
- 7 Kelvin model is composed of spring and dashpot in \_\_\_\_\_
- 8 The constant of proportionality in relating stress and strain for elastic bodies is known as \_\_\_\_\_
- 9 The four element model used to predict the creep behaviour is also known as \_\_\_\_\_
- 10 \_\_\_\_\_ is a measure of the food materials' ability to store electromagnetic energy

**II Write Short notes on any FIVE of the following**

**(5x2=10)**

- 1 Contact Stress
- 2 Bulk Modulus
- 3 Dashpot
- 4 Coefficient of friction
- 5 Terminal velocity
- 6 Dielectric loss factor
- 7 Thermal diffusivity

**III Answer any FIVE of the following.**

**(5x4=20)**

- 1 Classify –food materials based on rheological properties
- 2 Differentiate between dilatant and pseudoplastic fluid
- 3 Enumerate the methods of texture evaluation
- 4 Explain in detail about vibration damage
- 5 Describe about needle probe method
- 6 Calculate the sphericity of apple whose length, width and thick is 10 cm, 5 cm and 5.5 cm, respectively.
- 7 Calculate the value of decay in stress at the 5<sup>th</sup> minute in a simple Maxwell model where the initial stress is 60 Pa and time of relaxation is 35 minutes.

**IV Answer any ONE of the following**

**(1x10=10)**

- 1 Define friction and explain the effect of load and sliding velocity on friction.
- 2 Find out the volume and specific gravity of apple using platform scale method with the following data:
  - a. Weight of apple in air = 0.1322kg
  - b. Weight of container + water = 1.0147 kg
  - c. Weight of container + water + apple submerged = 1.1823 kg

\*\*\*\*\*