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

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

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^{th} 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

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