KERALA AGRICULTURAL UNIVERSITY

B.Tech (Food Engg.) 2011 Admission

IInd Semester Final Examination, July/August 2012

Cat. No: Fden.1201

Marks: 80

Title: Engineering Properties of Biological Materials (2+1)

Time: 3hours

PART –A

Fill up the blanks/Match the following/State true or False/Define
Answer all the questions   (10 x 1 =10)

1. Shear strain is also called as _____
2. For a linear stress – strain relationship, the ratio is expressed as _____
3. In the force deformation relationship curve, increase in deformation with a decrease or no change in force is known as _____
4. Stress relaxation deals with decay of stress at _____
5. Firmness of fruits relates with force and _____
6. Name the important electrical properties of the food materials
7. What is rheology?
8. Dielectric properties are _____ and _____
9. _____ law states that stress is directly proportional to strain within the elastic limit
10. Pure plastic behaviour of a material can be represented by a _____ mechanical model

PART – B

Write short notes/answers on any Ten   (10 x 3=30)

1. How to determine the volume of irregular shaped materials?
2. How the roundness of the agricultural material is determined?
3. State Fick's law of diffusion
4. Distinguish between storage modular and loss modular
5. Distinguish between diffusivity and conductivity
6. How to predict the food electrical properties?
7. Mention the relationship between dielectric properties and moisture content
8. What are the instruments used for measuring the texture and flow properties of the food materials?
9. List the models used for predicting the thermal properties
10. Mention the hydrodynamic properties
11. How to determine the angle of internal friction?
12. How to measure the drag coefficient?

PART –C
Answer any six of the following   (6 x 5=30)

1. Write the physical characteristics of the food grains
2. Explain the visco elastic properties of food materials
3. Explain the behavior of non Newtonian food material under applied shear stress
4. With schematic diagram explain the vibration damage of food materials
5. Illustrate the methods to determine the aero dynamic properties of food materials
6. Explain the concept of energy absorption from high frequency electric field.
7. Explain the principles of transient heat flow
8. Discuss the creep- stress relaxation behavior of food materials

Part-D
                                                                            (1 x 10=10)
Write essay on any One
1. Derive the Maxwell model and illustrate the applications of the Maxwell model in food properties.
2. Discuss the methods of determining thermal properties of food materials