



KERALA AGRICULTURAL UNIVERSITY
B.Tech.(Ag. Engg.) 2022 Admission
I Semester Final Examination – March 2023

Fape.1101

Engineering Properties of Agricultural Produce (1+1)

Marks: 50
Time: 2 hours

I Choose the Correct Answer

(10x1=10)

1. The dimensions of specific heat are
 - (a) $MLT^{-2}K^{-1}$
 - (b) $MLTK^{-1}$
 - (c) $M^{-1}LTK^{-1}$
 - (d) $M^0L^2T^{-2}K^{-1}$
2. As moisture content increases, the bulk density of the grain
 - (a) increases
 - (b) decreases
 - (c) remains constant
 - (d) None of these
3. The Air flow is measured by which instrument?
 - (a) salometer
 - (b) penitometer
 - (c) rotameter
 - (d) tensiometer
4. Apparent viscosity decreases with an increase in shear rate for
 - (a) Dialant fluid
 - (b) Pseudoplastic fluid
 - (c) Bingham Plastic
 - (d) Newtonian fluid
5. Rolling resistant is a
 - (a) Textural property
 - (b) Frictional property
 - (c) Rheological property
 - (d) Mechanical property

Define the following

6. Angle of repose
7. Sphericity of grain

State True or False

8. Thermal conductivity of frozen foods is much less than that of foods at room temperature.

Fill in the blanks

9. The separator is used for separation of broken grains from head rice in rice milling.
10. A..... represents the rheological model for newtonian liquid.

II Write short notes on ANY FIVE of the following

(5x2=10)

1. Thermal conductivity and thermal diffusivity
2. Psychometric chart
3. Bulk density and True density
4. Dielectric properties of foods
5. Sensible heat and latent heat
6. Maxwell and Kelvin models
7. Static and dynamic coefficient of friction

III Answer ANY FIVE of the following (5x4=20)

1. Grain stored in a grain bin is 297 tones. Diameter of grain bin is 6.1 m. Height of cylindrical section is 12.2 m. Height of conical section is 3.05 m. Determine the bulk density and grain volume if porosity is 40%.
2. Calculate the amount of ice required to cool 100 kg of mango from 40 C to 15 C if only latent heat of fusion is available for cooling. the specific heat of mango is 3.6 kJ/kg K. the latent heat of fusion is 335 kJ/kg.
3. The volume of a pea was measured to be 2700 mm³ by liquid displacement method. Find out equivalent diameter and sphericity of grain if radius of minimum circumscribing circle is 9 mm. determine roundness if projected area was measured to be 180 mm².
4. Discuss the Thixotropic fluid and pseudo plastic.
5. Derive expression for drag coefficient and terminal velocity.
6. The composition study of food mix at a moisture content of 40% (wb) is indicated that 100 g contains 40, 12, 5, 3 g of carbohydrates, protein, fat and ash respectively. Determine the change in specific heat if food mix is dried to 20 % moisture content (wb).
7. What is heat respiration and its effects on storage of grains.

IV Write an essay on ANY ONE of the following (1x10=10)

1. Describe about classification of different engineering properties of foods.
2. Describe about different equipments developed for cleaning, grading and storage of foods based on differences in engineering properties of the material.
