



SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : Engineering Properties of Biological Materials(16AG701)

Course & Branch: B.Tech – AG

Year &Sem: II-B.Tech& I-Sem

Regulation: R16

UNIT –I

CLASSIFICATION AND IMPORTANCE OF ENGINEERING PROPERTIES OF AGRICULTURAL PRODUCE

1. List out the Engineering Properties? Explain the importance of engineering properties of agricultural materials in design and handling of equipment? [10M]
2. Define the Volume? Determination of the Volume by platform scale method? [10M]
3. a) Define the Porosity? Explain the Air compression Pycnometer method with neat sketch? [07M]
b) A soil Pycnometer is designed on the principle of porosity tanks using this apparatus. The field porosity of soil was determined to be 16.78%. The soil moisture content was 29.65% (db) and its dry bulk density was 1.225gm/cc. If the volume of the measuring chamber was 728cc. Find the porosity of dry soil (Total porosity)? [03M]
4. a) Define surface area? Which methods are suitable for calculating surface area of potato and explain it? [05M]
b) How to measuring the surface area of leaf by using of Planimeter? [05M]
5. a) Define Apparent density? Which property is used for measuring the quality? [05M]
b) Define Roundness, Roundness ratio and Sphericity with neat diagram? [05M]
6. a) What are the principles of size reduction? [05M]
b) Explain the working principle of airflow Planimeter with neat diagram [05M]
7. Explain the shape and description of various agro commodities with examples? [10M]
8. a) Explain the methods for determining shape and size using of Vernier calliper and Screw gauge with neat sketch? [05M]
b) Tank-2 of the apparatus is filled with a sample of dry shelled corn to a bulk density of 752.86 kg/m³. The pressure readings were P₁=0.38M and P₃=0.26M. Find the porosity of the corn? [05M]

9. a) Define Bulk density and True density? [05M]
b) Define Density and Specific gravity? [05M]
10. Brief explains about surface area? Listout the surface area calculating methods? Explain about the graphical method in area calculation of leaf with diagram? [10M]

UNIT –II

THERMAL PROPERTIES

1. Briefly explain the thermal properties? [10M]
2. Determination of thermal conductivity of grains and food materials? [10M]
3. a) Discuss about the importance of thermal properties? [05M]
b) Explain about specific heat and latent heat? [05M]
4. a) Define the conduction, convection and radiation. ? [05M]
b) Explain about importance of heat treatment in food cereals? [05M]
5. a) Explain about factors effecting the thermal properties? [05M]
b) Define thermal processing of heating, cooling, freezing, drying, melting, freezing point? [05M]
6. Explain about the thermal conductivity, thermal diffusivity, surface heat transfer, emissivity and their importance in agriculture? [10M]
7. What type of thermal properties is considered at the time of design of dryer? [10M]
8. a) Difference between conduction convection radiation? [05M]
b) Describe enthalpy? [05M]
9. How can it useful thermal properties in agricultural sector? [10M]
10. Define
- i. Heat capacity [02M]
 - ii. Heat of respiration [02M]
 - iii. Coefficient of thermal expansion [02M]
 - iv. Specific latent heat [02M]
 - v. Thermal conductivity. [02M]

UNIT –III**FRICTION IN AGRICULTURAL MATERIALS**

1. What is angle of repose? Explain the methods for measuring angle of repose? [10M]
2. What is friction coefficient? Explain the internal and external friction? [10M]
3. What are frictional properties and Explain about static friction, kinetic friction and rolling resistance with neat diagram? [10M]
4. a) Briefly explanation about importance of frictional properties in agricultural engineering? [05M]
b) Explain about static angle of repose, dynamic angle of repose? [05M]
5. a) Difference between the angle of repose and angle of internal friction? [05M]
b) How moisture content effects the angle of repose? [05M]
6. Write importance of wall friction and kernel friction in design of chutes and hoppers? [10M]
7. Explain the determination of coefficient friction with neat sketch? [10M]
8. What is terminal velocity? Derive expression for terminal velocity? [10M]
9. What is drag coefficient? Derive expression for drag coefficient? [10M]
10. Briefly explain about flow of bulk granular materials? [10M]

UNIT –II**RHEOLOGICAL PROPERTIES**

1. Explain Rheological properties of ideal elastic, ideal plastic and pure viscous behavior with neat diagram? [10M]
2. Define Maxwell model and Explain Generalized Maxwell model with neat diagram? [10M]
3. Define Kelvin model and Explain Generalized Kelvin model with neat diagram? [10M]
4. A) Define the Rheology and classify the rheology with neat flow chart? [05M]
B) Briefly explain about importance of Rheology? [05M]
5. Classify and explain about non Newtonian fluids? [10M]
6. Briefly explain about the following [5×2=10M]
 - a. Elasticity
 - b. Plasticity

- c. Viscosity
 - d. Poisons law
 - e. Stress
7. Briefly explain about the following [5×2=10M]
- a. Nominal stress
 - b. Strain
 - c. Viscous behavior
 - d. Bingham plastic
 - e. Shear strength
8. Explain about the following [5×2=10M]
- a. Shear strain and shear stress
 - b. True strain and true stress
 - c. Tensile strain and tensile stress
 - d. Macro strain and micro strain
 - e. Normal stress and tensile strength
9. a) Explain about modulus of elastic?
- b) Explain about application of rheological data in food industry in food processing industry?
10. Explain about force deformation curve for an agricultural product with a neat sketch? [10M]

UNIT –V

ELECTRICAL PROPERTIES

- 1) Write brief explanation about importance of electrical properties and Summaries the difference between dielectric, ohmic and infrared energy? [10M]
- 2) Explain about the factors affecting the electrical properties of biological materials? [10M]
- 3) Explain about scope and importance of electrical properties of biological materials? [10M]
- 4) Explain about fundamentals of electrical properties? [10M]

- 5) Explain about electrostatic separation of seeds and foreign matters with neat figure? [10M]
- 6) Explain about dielectric heating? [10M]
- 7) a) Briefly explain about die electrical constant and die electrical loss factor? [05M]
b) Explain about methods of die electric measurements? [05M]
- 8) Explain about importance of mechanical, frictional properties in storage structures? [10M]
- 9) Briefly write about applications of die electric? [10M]
- 10) Write the short note on any five of the following [5×2=10M]
- (a) Textural property
 - (b) Ohmic energy
 - (c) Infrared energy
 - (d) Resistance energy
 - (e) Radio frequency
 - (f) Micro wave

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UNIT – I

CLASSIFICATION AND IMPORTANCE OF ENGINEERING PROPERTIES OF AGRICULTURAL PRODUCE

- The property which is useful and necessary in the design and operation of various equipment employed in the field of agricultural processing []
(A) Engineering properties (B) Mechanical properties
(C) Chemical properties (D) None of the above
- Which of the following physical properties are []
(A) Size and Shape (B) Surface area
(C) Volume and Density (D) All
- Various types of cleaning, grading and separation equipment's are designed on the basis of []
(A) Physical properties of seed (B) Mechanical
(C) Chemical (D) Aerodynamics
- Roundness is a measure of the sharpness of the []
(A) Solid material (B) Liquid material
(C) Spray material (D) Semi solid material
- The most widely accepted method for determining the roundness of irregular particles are
(A) Roundness = Area of smallest []
(B) Roundness = Largest projected area of the particles when it is in natural rest position
Area of smallest circumscribing circle

(C) Both a and b (D) None of these

6. Size of the irregular shaped food grains is represented by []
(A) Total diameter (B) Average diameter
(C) Perimeter (D) Equivalent diameter
7. Which one of the following can be used for measurement of area of leaf? []
(A) Pycnometer (B) Pyrometer
(C) Planimeter (D) Anemometer
8. Specific gravity of grains is determined by []
(A) Pycnometer (B) Toluene displacement method
(C) Refract meter (D) None of these
9. Quality of seed can be expressed by []
(A) Dormancy (B) Colour
(C) Vigour and viability (D) Texture
10. The density of wheat is about []
(A) 85 to 1100 kg/m³ (B) 498 to 1238 kg/m³
(C) 1150 to 1300 kg/m³ (D) 1200 to 1450 kg/m³
11. The SI unit of density is []
(A) Kg/m³ (B) Kg/cm³
(C) Kg (D) None of the above
12. The density of water is about []
(A) 1000kg/m³ (B) 1kg/m³ (C) 1000kg (D) 1m³
13. The specific gravity of water []
(A) 1 (B) 1000 (C) 10 (D) 100
14. The SI units for length is []
(A) Kg (B) m (C) s (D) None of these
15. The SI units for mass is []
(A) Kg (B) g (C) cm (D) m
16. The SI units for volume is []
(A) m³ (B) cm³ (C) kg/m³ (D) None of these
17. The SI units for temperature is []
(A) % (B) K (kelvins) (C) kg (D) None of these
18. Volume of cube []
(A) s³ (B) s² (C) s (D) None of these
19. Volume of rectangular []
(A) L*W (B) L*W*H (C) L*H (D) None of these

20. Volume of cylinder []
(A) $A \cdot H$ (B) $\frac{1}{3} A \cdot H$ (C) A^3 (D) None of these
21. Volume of cone and pyramid []
(A) $(\frac{1}{3})AH$ (B) $A \cdot H$ (C) $(\frac{4}{3})AH$ (D) None of these
22. Volume of sphere []
(A) $(\frac{4}{3})\pi r^3$ (B) $(\frac{4}{3})\pi r^2$ (C) πr^2 (D) None of these
23. Surface area of cube []
(A) $6a^2$ (B) πr^2 (C) πd^2 (D) None of these
24. Surface area of sphere []
(A) $A \cdot H$ (B) $4\pi r^2$ (C) $4\pi r^3$ (D) None of these
25. True density of product is determined by which of the following methods []
(A) Volume measurement (B) Surface area measurement
(C) Liquid displacement (D) Weight measurement
26. Porosity of food grains is in the range of []
(A) Above 75% (B) 30-45% (C) 10-20% (D) 50-70%
27. The SI units of porosity is []
(A) % (B) 0c (C) kg (D) None of these
28. The design and operation of mixing equipment depends mainly on []
(A) Physical properties (B) Rheological properties
(C) Both physical and rheological properties (D) None of the above
29. The bulk density of food depends on the following(s) []
(A) Solid density of food (B) Geometry of food
(C) Size and shape of individual particles (D) All of the above
30. ----- is an example of right circular cone object []
(A) Carrot (B) Apple (C) Egg (D) Lemon
31. Ratio of diameter of largest inscribing circle to the diameter of the smallest circumscribing circle is called []
(A) Roundness (B) Shape factor
(C) Sphericity (D) None of the above
32. Porosity is a property that []
(A) Changes as a result of change in color and surface of the product

- (B) Changes as a result of change in shape and particle density
(C) Changes as a result of change in the angle of repose
(D) Remains constant
33. True density of an agricultural produce is 1000 kg/m^3 and bulk density is 40 kg/m^3 . The porosity of the product is []
(A) 0.4 (B) 0.8 (C) 0.86 (D) 0.96
34. Agricultural produce (Grading and Marketing) act (AGMARK) is introduced in the year []
(A) 1987 (B) 1937 (C) 1947 (D) 2007
35. In India food safety and standards act as passed in the year []
(A) 1996 (B) 2006 (C) 2014 (D) None of these
36. When two containers of same material and volume are filled one with water and other with sunflower oil []
(A) Weight of two containers is same
(B) Container with water weight more than container with oil
(C) Container with oil weight more than container with water (D) None of these
37. When the quality of food product is assessed by means of human sensory organs, the evaluation is said to be []
(A) Sensory (B) Subjective (C) Organoleptic (D) All of these
38. FPO refers to []
(A) Food products order (B) Fruit products order
(C) Food processing order (D) None of these
39. ISO 9000:2000 quality management system leads with []
(A) Fundamental and vocabulary (B) Requirements
(C) Guidelines for performance and improvement (D) 2007
40. Moisture content dry basis []
(A) $M_{db} = (W_w/W_d) * 100$ (B) $M_{wb} = (W_w/W_d) * 100$
(C) $M_{wb} = (W_w/W_w + W_d) * 100$ (D) $M_{db} = (W_w/W_w + W_d) * 100$

UNIT –II
THERMAL PROPERTIES

1. Find the wrong statement: Specific heat of a material _____. []
(A) Constant for a material (B) Heat capacity per unit mass
(C) Extrinsic property (D) Has units as J/kg-K.
2. Heat capacity has units as []
(A) J/kg.K (B) J/mol.K (C) J.ohm/sec.K² (D) W/m.K
3. Units for thermal conductivity []
(A) J/kg.K (B) J/mol.K (C) J.ohm/sec.K² (D) W/m.K
4. Thermal expansion of a material has units as []
(A) J/kg-K (B) J/mol-K (C) J.ohm/sec.K² (D) 1/°C
5. The thermal conductivity of air is $k \text{ cal/m.hr}^{\circ}\text{C}$ []
(A) 0.02 (B) 0.002 (C) 0.012 (D) 0.0002
6. Polymers have thermal conductivities in the range of []
(A) < 1 (B) 1-10 (C) 10-100 (D) >100
7. Polymers have thermal expansion coefficients in the range of _____x10⁻⁶. []
(A) 0.5-15 (B) 5-25 (C) 25-50 (D) 50-400
8. Coefficient of thermal expansion for ceramics is the range of _____x10⁻⁶. []
(A) 0.5-15 (B) 5-25 (C) 25-50 (D) 50-400
9. Metals have thermal conductivities in the range of []
(A) < 1 (B) 1-5 (C) 5-25 (D) 20-400
10. Heat capacity of most materials is approximately equal to _____. []
(A) R (B) 2R (C) 3R (D) R/2
11. With increase in temperature, thermal conductivity of a metal _____. []
(A) Increases (B) Decreases (C) Either (D) All, depending on metal.

12. Thermal conductivity in polymers increases with _____. []
(A) Increase in crystallinity (B) Decrease in crystallinity (C) Either (D) None
13. Conduction plus fluid flow in motion is known as []
(A) Radiation (B) Conduction (C) Convection (D) Heat exchanger
14. Which of the following heat flow situations pertains to free or natural convection? []
(A) Air conditioning installations and nuclear reactors
(B) Flow of water inside the condenser tubes
(C) Cooling of internal combustion engine
(D) cooling of billets in atmosphere
15. Mark the system where heat transfer is given by forced convection []
(A) Chilling effect of cold wind on warm body
(B) Fluid passing through the tubes of a condenser and other heat exchange equipment
(C) Heat flow from a hot pavement to surrounding atmosphere
(D) Heat exchange on the outside of cold and warm pipes
16. Forced convection in a liquid bath is caused by []
(A) Intense stirring by an external agency
(B) Molecular energy interactions
(C) Density difference brought about by temperature gradients
(D) Flow of electrons in a random fashion
17. A finned tube hot water radiator with a fan blowing air over it is kept in rooms during winter. The major portion of the heat transfer from the radiator is due to []
(A) Combined conduction and radiation
(B) Radiation to the surroundings
(C) Better conduction
(D) Convection to the air
18. On a summer day, a scooter rider feels more comfortable while on the move than while at a stop light because []
(A) An object in motion captures less radiation
(B) Air has a low specific heat and hence it is cooler
(C) More heat is loss by convection and radiation while in motion
(D) Air is transparent to radiation and hence it is cooler than the body
19. Transfer of heat by actual movement of molecules from hot place to a cold place is known as []
(A) Radiation (B) Conduction (C) Convection (D) Fusion
20. Transfer of heat through actual movement of molecules is []

- (A) Conduction (B) Radiation (C) Convection (D) both B and C
21. In deep freezers, the walls absorb heat from food materials by _____ and keep them cool. []
(A) Conduction (B) Convection (C) Radiation (D) None of the mentioned
22. Which of the following is true about Natural Convection? []
(A) Low heat transfer
(B) Due to gravity and natural buoyant forces
(C) Dependent on viscosity, density and thermal conductivity
(D) All of the mentioned
23. The reciprocal of heat transfer co-efficient is _____ []
(A) Conductance (B) Resistance
(C) Density (D) Temperature difference
24. Statement 1: hd/k is _____ []
Statement 2: _____ is the ratio of convective heat transfer to conductive heat transfer.
(A) Prandtl number, Prandtl number (B) Nussel number, Nussel number
(C) Pictet number, Pictet number (D) Fourier number, Fourier number
25. To development of thermal processing systemare required []
(A) Thermal properties (B) Electrical properties
(C) Physical properties (D) None of these
26. Thermal properties does not include []
(A) Cooling (B) Heating
(C) Drying (D) Rubbing
27. Latent heat is aproperties []
(A) Thermal (B) Electrical (C) Biological (D) Physical
28. The heat treatment to the cereals and some of the pulses given for..... []
(A) Simulating germination (B) Simulate germination
(C) Cool germination (C) Hot germination
- 29.....is given for seeds for killing of insect-pest in recent years []
(A) Heat treatment (B) Cool treatment
(C) Conduction treatment (D) All of the above

30. For design of dryeris important step []
 (A) Calculation of heat requirement (B) Calculation of seed requirement
 (C) Calculation of floor requirement (C) All of the above
31. For calculation of sensible and latent heatare requires []
 (A) Specific heat (B) Thermal conductivity
 (c) Both A and B (d) None of this
32. Transient heat flow method for measuring thermal conductivity of food uses []
 (A) A spherical apparatus (B) A line heat source
 (C) A cylindrical apparatus (D) An ordinary thermo flask
33. The dimension of thermal diffusivity of a food is []
 (A) MLT^2 (B) $M^0L^2T^{-1}$ (C) $M^{-1}LT$ (D) M^0LT
34. The amount of heat in Kilo calorie that must be added to or removed from one Kg of substance to change its temperature by one degree is []
 (A) Latent heat (B) Specific heat (C) Enthalpy (D) Entropy
35. Unit of specific heat is []
 (A) kJ/kg K (B) W/mk (C) W/m^2k (D) kg/kJ m
36. For a black body the transmissivity is []
 (A) Zero (B) One (C) Nil (D) Above one
37. Thermal conductivity of a single grain is following times greater than that of bulk grain []
 (A) 1-2 (B) 2-3 (C) 3-4 (D) None of these
38. Thermal diffusivity can be expressed as []
 (A) $UA\Delta T$ (B) $-KA/(\Delta T/\Delta X)$ (C) $mC_p\Delta T$ (D) $K/\rho C_p$
39. Total heat content or energy level of the material is called as []
 (A) Enthalpy (B) Entropy
 (C) Thermal conductivity (D) Heat transfer coefficient
40. Which one of the following will have least value of thermal conductivity? []
 (A) Iron (B) Copper (C) Water (D) Air

UNIT -III

FRICITION IN AGRICULTURAL MATERIALS

1. Density of oats []

- (A) 963-654 (B) 738-968 (C) 998-1238 (D) 34.9
2. Terminal velocity of oats in m/s []
- (A) 9-11.5 (B) 8.5-10 (C) 8-9 (D) 34.9
3. Drag coefficient range of ground nut kernel []
- (A) 0.52-.064 (B) 0.38-0.62 (C) 0.33-0.51 (D) 34.9
4. Drag coefficient range of ground nut kernel soya bean (Punjab-1) []
- (A) 0.52-.064 (B) 0.38-0.62 (C) 0.33-0.51 (D) 34.9
5. Drag coefficient range of soya bean (Lee) []
- (A) 0.52-.064 (B) 0.38-0.62 (C) 0.33-0.51 (D) 34.9
6. Density of wheat []
- (A) 1111-998 (B) 325-985 (C) 998-1238 (D) 34.9
7. Density of corn []
- (A) 963-654 (B) 1138-1198 (C) 998-1238 (D) 34.9
8. Terminal velocity of corn in m/s []
- (A) 9-11.5 (B) 8.5-10 (C) 8-9 (D) 34.9
9. Terminal velocity of soya bean in m/s []
- (A) 44.3 (B) 8.5-10 (C) 8-9 (D) 34.9
10. Terminal velocity of Rye in m/s []
- (A) 9-11.5 (B) 8.5-10 (C) 8-9 (D) 34.9
11. Angle of friction for smooth sheet metal in degrees []
- (A) 15 (B) 8 (C) 25 (D) 38
12. Angle between the horizontal and inclination of heap is called the natural []
- (A) Angle of repose (B) Angle of internal friction
(C) Angle of external friction (D) Angle of friction

13. The frictional coefficient for food grains depend on []
(A) Grain shape (B) Surface characteristic
(C) Moisture content (D) All of the above
14. The maximum steep angel which will not let material slide down slope is called []
(A) Angle of mountain (B) Angle of repose
(C) Angle of slide (D) Complex angle
15. Terminal velocity of wheat in m/s []
(A) 9-11.5 (B) 8.5-10 (C) 8-9 (D) 34.9
16. In rice, angle of internal friction is []
(A) 25 Degrees (B) 18 Degrees (C) 20 Degrees (D) 24
Degrees
17. Safe moisture content of paddy (Wb) for storage over one year is []
(A) 8 per cent (B) 10 per cent (C) 12 per cent (D) 14 per
cent
18. Angle of repose of Wheat is []
(A) 23-28 (B) 30-45 (C) 30-40 (D) 28-40
19. Angle of repose of Paddy is []
(A) 23-28 (B) 30-45 (C) 30-40 (D) 28-40
20. Angle of repose of Maize is []
(A) 23-28 (B) 30-45 (C) 30-40 (D) 28-40
21. Angle of repose of Barley is []
(A) 23-28 (B) 30-45 (C) 30-40 (D) 28-40
22. Angle of repose of Millets is []
(A) 23-28 (B) 30-45 (C) 20-25 (D) 28-40
23. Angle of repose of Rye is []
(A) 23-28 (B) 30-45 (C) 23-28 (D) 28-40

24. For design of storage bins and chutesproperties are considered []
(A) Frictional (B) Thermal (C) Electrical (D) All
25. The friction may be defined as the frictional forces acting between surfaces of contact at rest with respect to each other []
(A) Dynamic friction (B) Moving friction (C) Static friction (D) All
26. Frictional force existing between the surfaces in relative motion []
(A) Dynamic friction (B) Moving friction (C) Static friction (D) All
27. Angle of friction taken up by granular material to just slide upon itself []
(A) Static angle of repose (B) Dynamic angle of repose
(C) Static friction (D) All
28. Dynamic angle of repose is calculated under []
(A) Grains under motion (B) Grains under static
(C) Both a and b (D) None of the above
29. In rice, angle of internal friction is: []
(A) 24-26 degree (B) 25-29 degrees (C) 26-29 degrees (D) All
30. In wheat, angle of internal friction is []
(A) 24-26 degree (B) 25-29 degrees (C) 26-29 degrees (D) All
31. In maize, angle of internal friction is []
(A) 24-26 degree (B) 25-29 degrees (C) 26-29 degrees (D) All
32. In barley, angle of internal friction is []
(A) 24-26 degree (B) 25-29 degrees (C) 26-29 degrees (D) All
33. The cohesive material haveangle of repose []
(A) Highest (B) Lowest (C) Medium (D) All
34. Lower angle of repose represent []
(A) Easily flow ability of product (B) Toughly flow ability of product
(C) Medium (D) All
35. Lower angle of repose represent []
(A) Easily flow ability of product (B) toughly flow ability of product

- (C) Medium (D) All
36. Internal friction is also called as []
 (A) Wall friction (B) Internal friction (C) Medium friction (D) All
37. External friction is also called as []
 (A) Wall friction (B) Internal friction (C) Medium friction (D) Kernel friction
38. Angle of friction for concrete in degrees []
 (A) 15 (B) 8 (C) 25 (D) 38
39. Angle of repose ----- with the increase of increase content of material []
 (A) Increase (B) Decrease (C) Constant (D) None of these
40. In case of bulk granular materials, the slope of yield locus is the angle of []
 (A) Internal friction (B) External friction (C) Coefficient of friction (D) None of these
- these

UNIT -IV

RHEOLOGICAL PROPERTIES

1. There is a non-linear relationship between shear stress and shear rate in []
 (A) Non – Newtonian fluid (B) Newtonian fluid
 (C) Both of these (D) None of these
2. For Newtonians fluids, the slope of the shear stress versus shear rate graph is Always []
 (A) Curve (B) Non -linear
 (C) Constant (D) Equal to zero
3. Rheological properties of material can be described by which property []
 (A) Elasticity (B) Plasticity
 (C) Viscosity (D) All of the above
4. If the viscosity of a fluid decreases with time, that fluid is called as []
 (A) Thixotropic (B) Rheopectic
 (C) Dilatant (D) Bingham plastic fluid
5. Voigt model (Kelvin model) consists of []
 (A) Spring and dash pot in series (B) Spring absent

- (C) Dash pot absent (D) Spring and dashpot in parallel
6. Voigt model (Kelvin model) consists of []
(A) Spring and dash pot in series (B) Spring absent
(C) Dash pot absent (D) Spring and dashpot in parallel
7. Which property of milk is not affected due to pasteurization process? []
(A) Rheological (B) Organoleptic
(C) Chemical (D) Textural
8. If the viscosity of a fluid decreases with time, that fluid is called as []
(A) Thixotropic (B) Rheopectic
(C) Dilatant (D) Bingham plastic fluid
9. Viscosity is a property of the fluid that represents []
(A) Resistance to heat flow inside the fluid
(B) Resistance of the fluid to shearing
(C) Conductance of the fluid to shear rate
(D) Temperature dependence of the cohesive forces during fluid movement
10. A Newtonian liquid flowing through a pipeline will have the velocity profile of the following shape []
(A) Semi-circular (B) An up-right straight line
(C) Parabolic (D) Hyperbolic
11. Rheology is the science of []
(A) Deformation in the metals
(B) Stress and strain behavior of metals
(C) Deformation and flow in the viscos elastic materials
(D) Flow of viscous products
12. Fluid which become more fluid (viscosity decreases), with time as they are stirred are known as []
(A) Pseudo plastic (B) Dilatant
(C) Thixotropic (D) Rheopectic
13. Rheology of food in the food processing industry is how the food is affected when _____ is applied. []
(A) Pressure (B) Butter
(C) None of the mentioned (D) All of the mentioned

22. S.I unit of Viscosity []
(A) Pa-sec (B) Pa/sec (C) N-m/sec (D) N-m
23. Which is the force per unit area? []
(A) Strain (B) Stress (C) Longitudinal strain (D) None
24. Elastic body represents []
(A) St. Venant body (B) Hooken body
(C) Newtonian liquid (D) Real biomaterial
25. Plastic body represents..... []
(A) St. Venant body (B) Hooken body
(C) Newtonian liquid (D) Real biomaterial
26. Viscous liquid represents []
(A) St. Venant body (B) Hooken body
(C) Newtonian liquid (D) Real biomaterial
27. Visco-elasticity obeys []
(A) St. Venant body (B) Hooken body
(C) Real biomaterial (D) Real biomaterial
28. Fluids which became more fluid, viscosity decrease with time is called _____ []
(A) Pseudo plastic (B) Dilatant (C) Thixotropic (D) Rheopectic
29. Ideal viscous behavior is observed property in []
(A) Hooken body (B) St. Venant body (C) Newtonian liquid (D) All the above
30. The Hookes law states that stress is directly proportional to----- within the elastic Limit []
(A) Strain (B) St. Venant (C) Newtonian (D) All the above
31. Hookes law holds true for small strains generally les then []
(A) 1% (B) 0.1% (C) 1.2% (D) All the above
32. Example for Newtonian fluids []
(A) Vegetable oils (B) Milk (C) syrups (D) All the above
33. Example for Non- Newtonian fluids []
(A) Vegetable oils (B) Milk (C) Starch (D) All the above

34. Property of material that returns to its original shape after the stress or external force is removed []
(A) Elasticity (B) Plasticity (C) Viscosity (D) All the above
35. Property of a material to undergo a permanent deformation under applied load []
(A) Elasticity (B) Plasticity (C) Viscosity (D) All the above
36. Measure of the resistance of a fluid to flow []
(A) Elasticity (B) Plasticity (C) Viscosity (D) All the above
37. Liquids generate a positive shear stress at zero shear rates []
(A) Elasticity (B) Bingham plastic (C) Viscosity (D) All the above
38.are the time dependent materials []
(A) Pseudo plastic (B) Bingham plastic (C) Dilatants (D) All the above
39.are the time independent dependent materials []
(A) Pseudo plastic (B) Bingham plastic (C) Dilatants (D) Rheopectic
40. Mechanical behavior of material is expressed in terms []
(A) Force (B) Deformation (C) Time (D) All the above

UNIT –V

ELECTRICAL PROPERTIES

1. Food texture can be evaluated bymethods []
(A) Instrumental (B) Intercultural
(C) Both a and b (D) All of the above
2.methods are less expensive and less time consuming as compared to sensory methods []
(A) Instrumental (B) Intercultural
(C) Sensory (D) All of the above
3.method is hard to repeat results []
(A) Instrumental (B) Intercultural
(C) Sensory (D) All of the above

4. Impedance is underproperty []
(A) Electrical (B) Frictional
(C) Rheological (D) All of the above
5. Loss factor of butter is..... []
(A) 0.1 (B) 0.2 (C) 0.3 (D) 0.5
6.is used for determining the moisture content of grain []
(A) Electrical conductance (B) Thermal conduction
(C) Angle of repose (D) Implement
7. Electrical conductance has been used for determining the of grain []
(A) Electrical content (B) Moisture content
(C) Number content (D) All of the above
8. Electrostatic separation of grains is also used for separating grains based on the ability of the grain to hold []
(A) Electrostatic charge (B) Thermostatic charge
(C) Electrical charge (D) Electrical conductivity
9. Electrical conductivity of the grain decides the ability of the material to hold[]
(A) Electrostatic charge (B) Thermostatic charge
(C) Electrical charge (D) Electrical conductivity
10.of the grain decides the ability of the material to hold electrostatic charge []
(A) Electrostatic charge (B) Thermostatic charge
(C) Electrical charge (D) Electrical conductivity
11. Recently has been in use for drying, pasteurization, blanching and other thermal processing of foods []
(A) Ohmic heating (B) Resistance
(C) Conductance (D) Temperature
12. Recently ohmic heating has been in use for []
(A) Drying (B) Blanching
(C) Pasteurization (D) All of the above
13. Ohmic heating has been using based on the []
(A) Resistance heating (B) Conductance heating

- (C) Radiation (D) All of the above
14. Ohmic processing, sometimes described as []
(A) Resistive heating (B) Conductive heating
(C) Radiation (D) All of the above
15. The efficiency of ohmic heating is dependent on the..... of the food []
(A) Conductive nature (B) Resistive nature
(C) Radiation (D) All of the above
16. play a major role in determining the interaction between the food material. []
(A) Die electrical properties (B) Thermal properties
(C) Electrical properties (D) All of the above
17. The degree of heating of a food material strongly influenced by the ... of the food. []
(A) Die electrical properties (B) Thermal properties
(C) Electrical properties (D) All of the above
18. Dielectric heating or volumetric heating occurs due toof molecules []
(A) Polarization (B) Ionization
(C) Polarization and ionization (D) Die polarization
19. Dielectric heating or volumetric heating are efficiently used in..... []
(A) Drying (B) Pasteurization (C) Sterilization (D) All of the above
20. Dielectric properties consist of..... []
(A) Die electric constant (B) Die electric loss factor
(C) Resistance (D) All of the above
21. is a measure of the ability of a material to store electromagnetic energy []
(A) Die electric constant (B) Die electric loss factor
(C) Resistance (D) Conductance
22. is a measure of the ability of a material to convert electromagnetic energy to heat []
(A) Die electric constant (B) Die electric loss factor
(C) Resistance (D) Conductance

23. Light transmittance and reflectance properties of agricultural commodities are used for determining the..... []
- (A) Sorting (B) Grading
- (C) Surface color (D) All of the above
- 24..... Properties of agricultural commodities are used for determining the sorting, grading, surface color. []
- (A) Optical (B) Frictional
- (C) Surface color (D) All of the above
25. Hyper spectral, multispectral, infrared imaging and computer vision system have enabled even determination of []
- (A) Moisture (B) Chemical composition
- (C) Both a and b (D) None of the above
26.are used for determination of moisture and other chemical composition []
- (A) Hyper spectral (B) Multispectral
- (C) Infrared imaging (D) All of the above
27. Electrical properties of the biological materials are broadly classified into.....types []
- (A) 2 (B) 1 (C) 3 (D) 5
28. Electrical properties of the biological materials are broadly classified into...types []
- (A) Active (B) Passive (C) Negative (D) All of the above
29.classification includes those properties characterized by the extended of some source of energy in the material []
- (A) Active (B) Passive (C) Negative (D) All of the above
30.classification includes those properties which influences the distribution of electromagnetic fields and currents in the region occupied by the material []
- (A) Active (B) Passive (C) Negative (D) All of the above
31. Electrical properties of the materials depends upon the []
- (A) Nature of the material (B) Environmental influence
- (C) Both a and b (D) None of the above
32. Which one is influences electrical property of the material []

- (A) Temperature (B) Moisture content
(C) Density of the material (D) All of the above
33. Dielectric constant of water is []
(A) 80 (B) 3-5 (C) 4-6 (D) 2-5
34. Dielectric constant of carbohydrates is []
(A) 80 (B) 3-5 (C) 4-6 (D) 2-5
35. Dielectric constant of proteins is []
(A) 80 (B) 3-5 (C) 4-6 (D) 2-5
36. Dielectric constant of fats is []
(A) 80 (B) 3-5 (C) 4-6 (D) 2-5
37. can be used to determine the extent of injury to plant tissues due to frost []
(A) Impedance technique (B) Technique
(C) Conductivity (D) All of the above
38. The depth of penetration of both microwaves and radio frequency energy is determined by the []
(A) Dielectric constant (B) Loss factor of the food
(C) Both a and b (D) None of the above
39. energy mostly used to heat or evaporate moisture from a product []
(A) Radio frequency (B) Frequency
(C) Both a and b (D) None of the above
40. The loss factor of banana is []
(A) 18 (B) 17 (C) 12 (D) 1

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