

Subject: Dairy Engineering

1. Thermal diffusivity can be calculated by using the following formula. (K- Thermal conductivity, ρ -Density, C_p - Specific heat)
 - a. $(K/\rho C_p)$
 - b. $(\rho C_p /K)$
 - c. $(K\rho C_p)$
 - d. $(K\rho/C_p)$
2. Last stage of freeze drying is
 - a. Absorption
 - b. Freezing
 - c. Sublimation
 - d. Desorption
3. Water activity of high moisture food ranges _____
 - a. 1 – 0.6
 - b. 1 - 0.5
 - c. 1 - 0.9
 - d. 0.6 – 0.9
4. For preparing 5% concentration of 100g sugar solution requires
 - a. 5 g sugar and 100 g water
 - b. 5 g sugar and 95 g water
 - c. 95 g sugar and 5 g water
 - d. 100 g sugar and 5 g water
5. Dew point temperature corresponds to the temperature at which
 - a. Dry and wet bulb temperatures are equal.
 - b. Dry and wet bulb temperatures are not equal.
 - c. Dry bulb temperature is higher than wet bulb temperature
 - d. Dry bulb temperature is lower than wet bulb temperature
6. Pick the odd one out
 - a. Forced circulation evaporator
 - b. Short tube evaporator
 - c. Rising film evaporator
 - d. Falling film evaporator
7. Surface structures start to crack due to
 - a. High moisture
 - b. Shrinkage
 - c. High water activity
 - d. High water content
8. During first falling rate period in - drying the
 - a. Drying rate increases
 - b. Drying rate remains constant
 - c. Drying rate can increase or decrease
 - d. Drying rate decreases
9. In air blast freezing, the velocity of air varies from

- a. 5 to 10 m/min
 - b. 10 to 20 m/min
 - c. 20 to 30 m/min
 - d. 30 to 120 m/min
10. All three phases of a matter exists at
- a. Melting point
 - b. Triple point
 - c. Dew point
 - d. boiling point
11. The boiling point of buffalo milk is _____ than cow milk
- a. Equal
 - b. Lower
 - c. Higher
 - d. Very high
12. Transient conduction means process of heat transfer
- a. with a very small temperature difference
 - b. with very little heat transfer
 - c. for a short time
 - d. where the temperature at a point varies with time
13. When helical compression spring is cut into halves, the stiffness of the resulting spring will be
- a. same
 - b. double
 - c. one-half
 - d. one-fourth
14. Brass is an alloy of.
- a. copper and zinc
 - b. Zinc and tin
 - c. copper and tin
 - d. aluminium and tin
15. In first-angle projection
- a. observer and object are same side of plane of projection
 - b. plane of projection lies between observer and object
 - c. object lies between observer and plane of projection
 - d. observer lies between object and plane of projection
16. Shell and tube type of Heat exchangers are suitable for
- a. Highly viscose products
 - b. Low viscose products
 - c. Very low viscose products
 - d. Milk products only
17. Thickness of PHE plate is in the range of .
- a. 1 to 10 mm
 - b. 1.5 to 15 mm
 - c. 1.5 to 3 mm

d.2.5 to 5mm

18. Baffles in Heat Exchangers are provided for _____ flow.
- Laminar
 - Periodic
 - plug
 - Turbulent
19. Fins are used to enhance heat transfer from a heated surface by
- Increasing the temperature difference
 - Increasing the convective heat transfer coefficient
 - Increasing the effective surface area
 - Decreasing the effective surface area
20. If moisture content of grain on wet basis is 25%, then moisture content on dry basis will be
- 20 %
 - 25 %
 - 30 %
 - 33%
21. Moisture content of 100% on dry basis is equivalent to the ____ moisture content on wet basis.
- 100%
 - 125%
 - 50%
 - 75%
22. Water activity of pure water is _____
- Less than one
 - Equal to one
 - Greater than one
 - Zero
23. The moisture commonly removed by drying is:
- Total moisture
 - Free Moisture
 - Equilibrium moisture
 - Bound moisture
24. Contact temperature of milk droplets in spray drying is in the range of
- 50-60°C
 - 70-80 °C
 - 60-65°C
 - 65-70°C
25. Milk fat exists in the form of a
- Water-in-oil type emulsion
 - Oil-in-water type emulsion
 - Colloidal solution
 - True solution

26. What is the size of fat in homogenized milk
a. 10 to 20 microns
b. 2 to 20 microns
c. 0.01 to 2 microns
d. 0.2 to 2 microns
27. Who invented spray dryer?
a. Fritz Winkler
b. Samuel Percy
c. John A
d. Jacques-Arsened' Arsonva
28. Milk is _____ with blood.
a. Isotonic
b. Hypertonic
c. Hypotonic
d. No pressure
29. Reynolds number for laminar flow over a plate should be less than:
a. 5×10^{10}
b. 5×10^{-10}
c. 5×10^5
d. 5×10^{-5}
30. Heat transfer by force of buoyancy occurs in
a. Forced convection
b. Forced conduction
c. Free convection
d. Free conduction
31. The wet bulb depression is Zero, when relative humidity is equal to
a. 10
b. 1.0
c. 0.5
d. 0
32. The power of fan is directly proportional to ----- . Where: N=Fan speed
a. N
b. N^2
c. N^3
d. N^4
33. Heat transfer follows
a. Zeroth law of thermodynamics
b. First law of thermodynamics
c. Second law of thermodynamics
d. Third law of thermodynamics
34. To provide turbulence in PHE system, _____ are provided.
a. Thin plates
b. Metal plates

- c. Impellers
 - d. Corrugation
35. Example of direct contact heat transfer is :
- a. Spray drying
 - b. Drum drying
 - c. Plate Heat Exchanger
 - d. Tray drying
36. In Drum drying product is removed after the drum has completed
- a. Full revolution
 - b. half revolution
 - c. 3/4 to 7/8 revolution
 - d. 1/2 to 3/4 revolution
37. What is alternative name for freeze drying?
- a. Lyophilisation
 - b. Cold pasteurization
 - c. Irradiation
 - d. Liposuction
38. Raw milk the storage temperature generally will be at :
- a. 4°C
 - b. 14°C
 - c. -14°C
 - d. 0°C
39. Milk is an example of :
- a. Non-Newtonian fluid
 - b. Newtonian fluid
 - c. Thixotropic
 - d. Bingham type
40. The viscosity of Newtonian fluid _____ with respect to shear rate.
- a. Change
 - b. Vary rapidly
 - c. Not constant
 - d. Does not change
41. Triple point of a substance occurs at specific combination of :
- a. Temperature & volume
 - b. Flow rate & volume
 - c. Temperature & pressure
 - d. Pressure & volume
42. At Equilibrium Relative Humidity the product:
- a. Loses moisture
 - b. Gains moisture
 - c. Either gains or loses moisture
 - d. Neither gains nor loses moisture

43. Sensible heat is the heat energy required to change the temperature:
- Without changing its state
 - With changing its state
 - With always changing its volume
 - With always changing its pressure
44. Latent heat of fusion is the heat energy required:
- To change liquid into gas
 - To change gas into liquid
 - To change solid into liquid
 - To change liquid into solid
45. Latent heat for 1 kg of water to be converted into steam is:
- 100 k Cal/kg
 - 80 k Cal/kg
 - 540 k Cal/kg
 - 335 k Cal/kg
46. Exergy is the energy:
- Gained from surroundings
 - Lost to surroundings
 - Not available for use
 - Available for use
47. Total heat content or energy level of a material is:
- Enthalpy
 - Exergy
 - Latent heat energy
 - Sensible heat energy
48. Reynolds number for laminar flow through pipe should be less than:
- 1100
 - 1500
 - 1600
 - 2100
49. Two shafts A and B are made of the same material. The diameter of the shaft A is twice as that of shaft B. The power transmitted by the shaft A will be _____ of shaft B.
- eight times
 - four times
 - twice
 - Same
50. Which of the following material has the maximum ductility
- copper
 - mild steel
 - aluminium
 - nickel

51. SI unit of pressure is:
a. mm of Hg
b. PSI
c. Pascal
d. Bar
52. Pressure value of 1 atmosphere equals:
a. 1.01325 bar
b. 76 mm of Hg
c. 760 cm of Hg
d. 1.01325×10^5 bar
53. Disruption of fat globules into much smaller fat globules is defined as?
a. Standardization
b. Homogenization
c. Centrifugation
d. Chilling
54. In a double stage milk homogenization system, the pressure at second stage remains at about:
a. 500 psi
b. 1000 psi
c. 1500 psi
d. 2000 psi
55. Thermal diffusivity measures the _____ of heat transfer.
a. total amount
b. total volume
c. pressure
d. rate
56. Ammonia, a common refrigerant has the boiling point at:
a. 33.3°C
b. -33.3°C
c. -100°C
d. 100°C
57. Generally the reaction rate is _____ by lowering the temperature by 10°C.
a. increased by double
b. reduced by one fourth
c. reduced by half
d. increased rapidly
58. Thermal co-efficient of linear expansion relates to:
a. Milk
b. Liquid

- c. Solids
 - d. Gas
59. The SI unit of Reynolds number is
- a. Pa.s
 - b. N/ms
 - c. kJ
 - d. No unit
60. Viscosity of a gas:
- a. Increases with increasing temperature
 - b. Increases with decreasing temperature
 - c. Decreases with increasing temperature
 - d. Does not change with increasing temperature
61. 18/8 steel contains
- a. 18% Ni and 8% Cr
 - b. 18% Ni and 8% Co
 - c. 18% V and 8% Co
 - d. 18% Cr and 8% Ni
62. Psychrometric chart is a representation of:
- a. Electrical properties
 - b. Thermostatic properties
 - c. Chemical & thermostatic properties
 - d. Thermodynamic properties
63. Psychrometric chart is _____ representation of moist air:
- a. Graphical
 - b. Imaginary
 - c. Non-linear
 - d. Thermostatic
64. During sensible heating of air, the RH _____ and enthalpy _____.
- a. Increases ; decreases
 - b. decreases ; decreases
 - c. decreases ; increases
 - d. increases ; increases
65. When RH is 100%, the rate of evaporation of water will be:
- a. Zero
 - b. Less
 - c. Very high
 - d. High
66. Hooke's law holds good upto
- a. yield point
 - b. elastic limit

- c. plastic limit
 - d. breaking point
67. Reynolds number is the ratio of:
- a. (viscous force / inertia force)
 - b. (inertia force / viscous force)
 - c. (angular force / viscous force)
 - d. (viscosity / viscous force)
68. Bernoulli's theorem refers to the _____ of energy.
- a. Frictional Loss
 - b. Consumption
 - c. Conservation
 - d. environmental loss
69. A localised compressive stress at the area of contact between two members is known as
- a. bearing stress
 - b. tensile stress
 - c. shear stress
 - d. compressive stress
70. When flow behaviour index $(n) > 1$ fluid is called
- a. Casson plastic
 - b. Bingham plastic
 - c. Pseudoplastic
 - d. Dilatant
71. Fluid in which viscosity decreases with increase shear force:
- a. Newtonian
 - b. Dilatent
 - c. Thixotropic
 - d. Bingham plastic
72. All stresses produced in a belt are
- a. tensile stress
 - b. compressive stress
 - c. both tensile and compressive stress
 - d. shear stress
73. During the humidification process, RH increases, and the dry bulb temperature :
- a. Increases
 - b. Decreases
 - c. Remain same
 - d. Decreases fast

74. The by-pass factor of a cooling coil decreases with
a. decrease in fin spacing and decrease in number of rows
b. increase in fin spacing and increase in number of rows
c. decrease in fin spacing and increase in number of rows
d. increase in fin spacing and decrease in number of rows
75. In an Isochoric non-flow process, the :
a. Volume in the system remains constant
b. Pressure in the system remains constant
c. Temperature in the system remains constant
d. Energy in the system remains constant
76. In an adiabatic process, the :
a. heat transfer rate is maximum
b. heat transfer rate is fast
c. heat transfer rate is very fast
d. heat transfer rate is zero
77. The resistance of thermistor sensor will _____ with increase temperature.
a. Increase
b. Decrease
c. Remain constant
d. Increase fast
78. A Thermocouple temperature sensor works on the principle of _____ effect.
a. Joule-Thomson
b. Peltier
c. Seebeck
d. Newton
79. Backlash in an instrument is a kind of _____ error.
a. Electrical
b. Mechanical
c. Environmental
d. Sensitivity
80. In a chilled mirror method of RH measurement condensation occurs at:
a. Wet bulb temperature
b. Dry bulb temperature
c. Dew point
d. Triple point
81. Which law of thermodynamics is used for temperature measurement
a. Zeroth law
b. First law
c. Second law
d. Newton's law

82. Rotameters can be used in _____ position.
- Parallel
 - Vertical
 - Horizontal
 - At any position
83. Number of secondary coil in a LVDT is/are:
- 1
 - 2
 - 3
 - 4
84. Systematic errors in an instrument occur due to:
- Largely human mistakes
 - Shortcomings of instruments
 - Fitting mistake
 - Using wrong connections
85. Pointer on the scale of an instrument does not come to rest immediately due to:
- Mass & inertia
 - Sensitivity
 - Static characteristics
 - Low accuracy
86. The lengths of low & high co-efficient of thermal expansion metals can be used for:
- Temperature measurement
 - Very small length measurement
 - Pressure measurement
 - Level measurement
87. Type of tiles used in reception dock of dairy plants-
- Mandana stone tiles
 - anti skit tiles
 - Iron grid tiles
 - Kota stone tiles
88. The strain gauge based sensors work on the principle of:
- Fourier's rate law
 - Newton's law of cooling
 - Wheatstone Bridge
 - Joule's law
89. The Resistive strain gauge is of the following types of transducer:
- Active type
 - Passive type

- c. Capacitive type
- d. Inductive

90. Which one of the following is an active transducer?
a. LVDT
b. Strain gauge
c. Piezo-electric transducers
d. Thermistors
91. Reproducibility of results by an instrument is the measure of its:
a. Resolution
b. Precision
c. Sensitivity
d. Overshoot
92. The minimum value of input below which no output can be detected is :
a. Threshold
b. Precision
c. Sensitivity
d. Overshoot
93. If the velocity of air flowing through the duct is V m/min, then the velocity pressure (p_v) in mm of water is given by:
a. $\left(\frac{V}{4.04}\right)^2$
b. $\left(\frac{V}{40.4}\right)^2$
c. $\left(\frac{V}{242.4}\right)^2$
d. $\left(\frac{V}{24.24}\right)^2$
94. HMI in a SCADA system stands for:
a. Home made instruments
b. Human Manufactured Instruments
c. Hand Mind Interface
d. Human Machine Interface
95. The desired value or set value of the output is being continuously monitored by a
a. Sensor
b. Valve
c. Controller
d. Timer
96. PLC is a:

- a. Sensor
 - b. Valve
 - c. Controller
 - d. Diode
97. _____ is the brain of control system that takes decision to maintain the process variable at its desired set point value.
- a. Transducer
 - b. Controller
 - c. Servo motor
 - d. Valve
98. Valves, conveyors, electric motors are the examples of:
- a. Process variables
 - b. Transmitters
 - c. Final control element
 - d. Sensors
99. PID refers to a
- a. Open-loop control system
 - b. Closed-loop control system
 - c. Continuous loop system
 - d. No loop system
100. The work requirement for a reciprocating compressor is minimum when the compression process is:
- a. isothermal
 - b. isentropic
 - c. polytropic
 - d. adiabatic
101. The entropy of the system in a irreversible non-flow thermodynamic process :
- a. Always decreases
 - b. Remains constant
 - c. Always increases
 - d. Decreases fast
102. A heat engine is supplied with 800 kJ/sec of heat at 600 K and rejection takes place at 300 K. Which of the following results report a reversible cycle?
- a. 100 kJ/sec are rejected
 - b. 200 kJ/sec are rejected
 - c. 300 kJ/sec are rejected
 - d. 400 kJ/sec are rejected

103. From the addition of salt, the freezing point of the solute is :
a. Elevated
b. Depressed
c. Remain same
d. Not changed
104. At the same temperature normally the vapour pressure of aqueous solution compared to water is :
a. More
b. Equal
c. Less
d. Remain same
105. The throttling process is a:
a. non-flow process
b. non-steady-flow process
c. steady-flow process
d. unsteady process
106. At which temperature both Celsius and Fahrenheit scales have the identical numerical values ?
a. 0°C
b. 100°C
c. -40°C
d. - 10°C
107. A pyrometer can be used to measure :
a. Temperature
b. Pressure
c. Humidity
d. Volume
108. The clearance factor is the ratio of:
a. swept volume of the cylinder to the clearance volume
b. total volume of the cylinder to the clearance volume
c. clearance volume to the swept volume of the cylinder
d. clearance volume to the total volume of the cylinder
109. Milk is deficient in :
a. Iron
b. Fat
c. Calcium
d. Protein
110. The fluid side heat transfer coefficient (h_f) when liquid flows through the evaporator shell is given by:
a. $C\sqrt{m}$

- b. Cm
- c. Cm^4
- d. Cm^2

111. Biot number equals : (K-Thermal conductivity, l-length, h-Convective heat transfer coefficient)
- a. (hl/K)
 - b. (K/hl)
 - c. (hlK)
 - d. (h/Kl)
112. The moisture content present in the milk powder produced in spray drier:
- a. 0 -1 %
 - b. 10 -15 %
 - c. 3 -5 %
 - d. 5 -10 %
113. The inlet air temperature, entering the drying chamber of a spray drier, is in the range of:
- a. 0 -100°C
 - b. 50 -100°C
 - c. 180 -200°C
 - d. 280 -300°C
114. As evaporation proceeds, solution becomes more concentrated and viscous, causing heat transfer coefficient to :
- a. Drop
 - b. Rise
 - c. Remain constant
 - d. Rise fast
115. The milk protein, Casein, is _____ in water.
- a. Soluble
 - b. Insoluble
 - c. Mixed
 - d. Not separable
116. An F_0 value of 3 min indicates that the process is equivalent to a heat treatment of 3 min at:
- a. 125.5°C
 - b. 122.2°C
 - c. 121.1°C
 - d. 101.1°C
117. When milk is secreted in the udder it is generally :
- a. Sterile

- b. Infected by bacteria
- c. Infected by moulds
- d. Infected by yeasts

118. Which of the following refrigerant is highly toxic and flammable
- a. carbon dioxide
 - b. ammonia
 - c. sulphur dioxide
 - d. R-12
119. Water activity is related to ERH (Equilibrium RH) as follow :
- a. Water activity = ERH-100
 - b. Water activity = ERH*100
 - c. Water activity = ERH/ 100
 - d. Water activity = ERH+100
120. During refrigeration cycle, heat is rejected by the refrigerant in a
- a. Compressor
 - b. Evaporator
 - c. Condenser
 - d. Expansion valve

1.	A
2.	D
3.	C
4.	B
5.	A
6.	A
7.	B
8.	D
9.	D
10.	B
11.	C
12.	D
13.	B
14.	A
15.	C
16.	A
17.	C
18.	D
19.	C
20.	D
21.	C
22.	B
23.	B
24.	A
25.	B
26.	D
27.	B
28.	A
29.	C
30.	C

31.	B
32.	C
33.	C
34.	D
35.	A
36.	C
37.	A
38.	A
39.	B
40.	D
41.	C
42.	D
43.	A
44.	C
45.	C
46.	D
47.	A
48.	D
49.	A
50.	B
51.	C
52.	A
53.	B
54.	A
55.	D
56.	B
57.	C
58.	C
59.	D
60.	A

61.	D
62.	D
63.	A
64.	C
65.	A
66.	B
67.	B
68.	C
69.	A
70.	D
71.	C
72.	A
73.	C
74.	C
75.	A
76.	D
77.	B
78.	C
79.	B
80.	C
81.	A
82.	B
83.	B
84.	B
85.	A
86.	A
87.	C
88.	C
89.	B
90.	C

91.	B
92.	A
93.	C
94.	D
95.	A
96.	C
97.	B
98.	C
99.	B
100.	A
101.	C
102.	D
103.	B
104.	C
105.	C
106.	C
107.	A
108.	C
109.	A
110.	A
111.	A
112.	C
113.	C
114.	A
115.	B
116.	C
117.	A
118.	B
119.	C
120.	C