

SUBJECT: FOOD PROCESSING TECHNOLOGY**Time: 1 Hour 30 minutes****Instructions:**

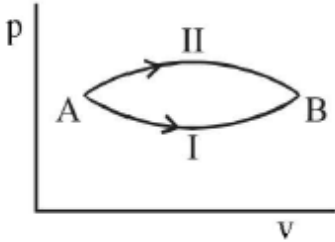
1. Ensure that all pages are printed.
2. Use Black ball pen only
3. Change in option is not allowed
4. There is no negative marking
5. Use of non -programmable scientific calculator is allowed

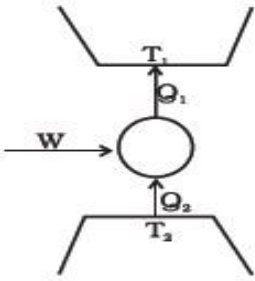
1.	Gases behave ideally			
	A	At sufficiently high temperatures	B	At very low temperatures
	C	At sufficiently high temperatures and low pressures	D	At sufficiently high pressures and low temperatures
2.	Gibbs phase rule for general thermodynamic system having C components is			
	A	$P+F=C-2$	B	$P+F=C-1$
	C	$P+F=C+1$	D	$C = P + F - 2$
3.	The organisms who can synthesize their own food are termed as			
	A	Autotrophic	B	Heterotrophic
	C	Chemoautotrophic	D	Chemoheterotrophic
4.	Heat transfer from higher temperature to lower temperature takes place			
	A	According to First law of thermodynamics	B	According to Second law of thermodynamics
	C	According to Zeroth law of thermodynamics	D	According to Fourier law
5.	Water activity of a food product is			
	A	Equal to EMC	B	Half of EMC
	C	Always more than 1	D	Thermodynamic property
6.	Destruction of which enzyme is used as an index in super HTST Pasteurization of milk			
	A	Lipase	B	Lacto-peroxidase
	C	Catalase	D	All of the above
7.	The main protein present in milk is			
	A	Lactoglobulin	B	Albumin
	C	Lactalbumin	D	Casein
8.	A closed system undergoes an increase in internal energy change by 600 kJ. The work done on the system during the process is 400 kJ. The heat transfer will be			
	A	200 kJ	B	- 200 kJ
	C	1000 kJ	D	Zero
9.	Greenhouse effect leads to			
	A	Ozone layer depletion	C	Formation of CO ₂
	C	Melting of polar ice	D	None of the above
10.	Which of the following is a natural color?			
	A	Tartrazine	B	Chlorophyll
	C	Sunset yellow	D	Indigotine
11.	When water goes from a solid to a gas without passing through the liquid phase			
	A	Transfusion	B	Condensation
	C	Evaporation	D	Sublimation

12.	1TR of refrigeration is equal to			
	A	3.5167 W	B	7 kW
	C	3.5167 kW	D	10 kW
13.	A single-effect continuous evaporator is used to concentrate a fruit juice from 15 °Brix to 40 °Brix. The juice is fed at 25°C, at the rate of 5400 kg/h. The required water evaporation capacity will be			
	A	3375 kg/h	B	1.2 kg/s
	C	3400 kg/h	D	1.5 kg/s
14.	A food material weighing 50 kg is initially at 450% moisture content dry basis. It is dried to 25% moisture content wet basis. How much water is removed from the sample per kg of dry solids?			
	A	12.133 kg/kg	B	9.1 kg/kg
	C	37.86 kg/kg	D	4.16 kg/kg
15.	A laboratory procedure specifies centrifugation of a liquid 'at 10 000 g' ($g = 9.81 \text{ m/s}^2$). A centrifuge with an effective bowl diameter of 12 cm is available. What should be the speed of rotation of a centrifuge to meet the specification?			
	A	7588 RPM	B	2250 RPM
	C	8634 RPM	D	3500 RPM
16.	FTNIR is associated with determination of food moisture by			
	A	Spectroscopic method	B	Chemical analysis
	C	Thermal technique	D	Gravimetric method
17.	Which dryer involves lyophilization?			
	A	Freeze dryer	B	Drum dryer
	C	Spray dryer	D	Flash dryer
18.	A solid food material is ground between two corrugated surfaces moving with respect to each other. Which machine best describes such an operation?			
	A	Pressure mill	B	Impact mill
	C	Attrition mill	D	None of the above
19.	Size reduction is a widespread unit operation in food processing. Identify the one for which it is not suitable.			
	A	Accelerating heat and mass transfer	B	Facilitating mixing and dispersion
	C	Obtaining a desirable product texture	D	Separation of volatile solvents in solution
20.	Nisin is used as			
	A	Antimicrobial agent	B	Stabilizer
	C	Emulsifier	D	Sweetener
21.	After critical moisture content _____ starts.			
	A	Saturated drying region	B	Falling rate drying
	C	Constant rate drying	D	None of the above
22.	Decimal reduction time for microbial destruction is inversely proportional to			
	A	D- Value	B	Z-Value
	C	F-Value	D	Reaction rate
23.	Which of the following microorganisms is commonly known as 'Pink Bread Mould'?			
	A	Neurospora	B	Mucor
	C	Aspergillus	D	Rhizopus
24.	HTST pasteurization of milk is based on completed destruction of			
	A	C. botulinum	B	E. coli
	C	B. subtilis	D	Coxiella Burnetii

25.	For fruit and vegetables-based products, in which format FSSAI licence is issued?			
	A	Format A	B	Format C
	C	Format B	D	Format D
26.	An experimental sample of 75g of shredded onions containing 66g of water was put in a tray dryer having a load cell arrangement to measure mass as a function of time. After 2 hours the mass of the product decreases to 21g. At this stage the % dry basis moisture content of the product is close to			
	A	1.3	B	163%
	C	133%	D	None of the above
27.	Which of the following is not a mandatory standard?			
	A	Codex Alimentarius Standards	B	The Essential Commodities Act, 1955
	C	The Insecticides Act, 1968	D	Food Safety and Standards Act, 2006
28.	Baker's yeast glycan is derived from			
	A	Candida utilis	B	Streptomyces chattanoogensis
	C	Stabilizer	D	Saccharomyces cerevisiae
29.	Following operations are adopted for cleaning in place (CIP) of equipment P: Cold water rinse; Q: Hot water rinse; R: Alkali cleaning; S: Acid cleaning. The correct sequence of CIP for equipment used in UHT processing of milk is			
	A	$P \rightarrow Q \rightarrow R \rightarrow S \rightarrow P$	B	$P \rightarrow Q \rightarrow R \rightarrow P$
	C	$P \rightarrow Q \rightarrow R \rightarrow Q \rightarrow S \rightarrow P$	D	$P \rightarrow Q \rightarrow S \rightarrow P$
30.	During controlled atmospheric storage of foods, composition of which of the following set of gases is controlled			
	A	$O_2 + N_2$	B	$CO_2 + N_2$
	C	$C_2H_4 + N_2$	D	$CO_2 + O_2$
31.	The water activity of an ideal glucose solution having a mole fraction of 0.25 is			
	A	25%	B	0.33
	C	0.25	D	0.75
32.	'Red dog' is one of the by-products during milling of			
	A	Corn	B	Wheat
	C	Rice	D	Ragi
33.	A food factory receives 1525 kg of a product with a dry basis moisture content of 6.5 g of water per gram of dry solids. The mass of water and dry solids present in the product are respectively			
	A	203kg and 1322 kg	B	1322 kg and 203 kg
	C	433 kg and 11245 kg	D	Can't be calculated
34.	During food preparation and processing, the application of dry heat can cause a change in the physical properties of starch. This is called			
	A	Coagulation.	B	Emulsification
	C	Dextrinization.	D	Caramelization.
35.	The rich flavour associated with L-glutamate is called as			
	A	MSG	B	IMP
	C	GMP	D	Umami
36.	The expansion of the terms HACCP and GRAS are			
	A	Hygienic Associated Critical Control Point; Grossly Recommended as Safe	B	Hygienic and Aesthetic Concept of Critical Products; Generally Recognized as Safe

	C	Hazard Analysis and Critical Control Point; Grossly Recommended as Safe	D	Hazard Analysis and Critical Control Point; Generally Recognized as Safe
37.	The method of packaging of food under sterile environment, after independently sterilizing the food and packaging material, is termed as			
	A	Aseptic packaging	B	Vacuum packaging
	C	Flexible packaging	D	Active packaging
38.	The sanitizing action of Chlorine when mixed in water is due to formation of			
	A	Nascent Oxygen	B	HOCl
	C	HCl	D	Both A and B
39.	Particle density of a fruit powder is 1.95 g/cm^3 and the porosity of the bulk is 36%. The bulk density of the powder in g/cm^3 will be			
	A	1.25	B	2.00
	C	1.00	D	1.12
40.	Cutting and chopping are size reduction operations based on			
	A	Shearing	B	Attrition
	C	Compression	D	Periodic motion
41.	The most important factor responsible for making a good ice cream is			
	A	Water content	B	Homogenization
	C	Emulsifying agent	D	Mixing index
42.	A continuous dryer was used to dry 12 kg/min of a blanched vegetable containing 50% moisture (wet weight basis) to give a product containing 10% moisture. As the dryer could handle feed material with moisture content not more than 25%, a part of dried material was recycled and mixed with the fresh feed. The evaporation rate in the dryer would be			
	A	2.08 kg/min	B	2.93 kg/min
	C	3.33 kg/min	D	5.33 kg/min
43.	The protein responsible for spongy structure in bread is			
	A	Albumin	B	Zein
	C	Gliadin	D	Gluten
44.	Make the correct match of food constituents in Group I with their nature given in Group II. Group I : P) Ascorbic Acid Q) Phenyl alanine R) Dextrose S) Hemoglobin Group II: 1) Sugar 2) Chelate 3) Amino Acid 4) Antioxidant			
	A	P-4, Q-1, R-3, S-2	B	P-3, Q-4, R-2, S-1
	C	P-4, Q-3, R-1, S-2	D	P-4, Q-2, R-1, S-3
45.	Tomatoes can be dried with maximum quality retention by			
	A	Tray drying	B	Freeze drying
	C	Spray drying	D	Heat pump drying
46.	A cyclone separator is used for the separation of			
	A	Liquid droplets from gas	B	Fine particles from gas
	C	Particle from liquid	D	Fine particles from solids
47.	Thermal death time (TDT) of Clostridium botulinumz X at 121°C is 2.78 min with a z-value of 10°C . The TDT of the microorganism at 116°C (in min) is			
	A	5.270	B	1.390
	C	8.791	D	0.712
48.	In high temperature short time method of pasteurization, milk is heated at temperature:			
	A	72°C for 15 seconds	B	72°C for 30 minutes
	C	62°C for 15 seconds	D	62°C for 30 minutes

49.	A system goes from state A to B via path I and II as shown in figure. ΔU_1 - Change in internal energy in Path I ΔU_2 - Change in internal energy in Path II  Which of the following is true?				
	A	$\Delta U_1 > \Delta U_2$	b.	B	$\Delta U_1 < \Delta U_2$
	C	$\Delta U_1 = \Delta U_2$		D	Relation between ΔU_1 and ΔU_2 cannot be determined
50.	Consider a closed system reversible process such that the pressure (in kPa) and volume (in m^3) of a gas are related as $P = 4V$ kPa. If volume changes from from 2 m^3 to 3 m^3 , the work done in kJ will be equal to				
	A	5		B	15
	C	10		D	12
51.	If the co-efficient of performance of a Carnot cycle-based refrigerator is 5 and it operates at the room temperature (27°C), then the temperature inside the refrigerator will be				
	A	255 K		B	4°C
	C	270 K		D	-23°C
52.	Which amongst the following is an example of classical diffusion mass transfer process without involving heat?				
	A	Drying of food grains		B	Distillation of alcohol
	C	Carbonation of beverages		D	Concentration of fruit juice
53.	A 5 cm od (outside diameter) steel pipe is carrying steam at 150°C . The pipe is insulated with a cylindrical shell of insulator, 3 cm thick ($k = 0.03 \text{ W/mK}$). The rate of heat loss per meter of pipe length, if the temperature of the outer surface of the insulation is 35°C will be				
	A	88.3 W/m		B	27.5 W/m
	C	22 W/m^2		D	4.4 W/mm
54.	A food processing factory receives 2000 kg of a product with a dry basis moisture content of 4 kg of water per kg of dry solids. The ratio mass of water to dry solids present in the product are respectively				
	A	5		B	6
	C	4		D	9
55.	650 g of a wet food containing 405 g water is dried in a tray dryer to a final moisture content of 6.8% (dry basis). It is observed that the drying process occurs under constant rate period and it takes 8 h. Initial moisture content (in percentage) of the food on wet basis is				
	A	62.31%		B	70.45%
	C	25%		D	80%
56.	A method in which continuous electric current is passed through food to heat it rapidly while maintaining quality is called				
	A	Microwave cooking		B	Sonication
	C	Irradiation		D	Ohmic heating
57.	Mold inhibitor used in bread is				
	A	Calcium carbonate		B	Sodium / Calcium propionate

	C	Sodium chloride	D	None of these
58.	Iodized salt contains iodine in the form of			
	A	I ₂	B	KI
	C	KIO ₃	D	NaI
59.	<p>Consider a thermodynamic system as shown in Figure. Q_1 and Q_2 are heat added to heat bath T_1 and heat taken from T_2 in one cycle of engine. W is the mechanical work done on the engine. If $W > 0$, then possibilities are:</p>  <p>Fig .12.7</p>			
	A	$Q_1 > Q_2 > 0$	B	$Q_2 < Q_1 < 0$
	C	$Q_1 < 0, Q_2 > 0$	D	$Q_2 > Q_1 > 0$
60.	Which refrigerant is commonly used in commercial cold storage plants in our country?			
	A	Ammonia	B	Ethylene
	C	Sodium Benzoate	D	Carbide
61.	Which one of the following is NOT A CORRECT statement?			
	A	Meatiness is the taste produced by compounds such as glutamate in products like cheese, soy sauce.	B	Astringency is a dry mouth feel in the oral cavity that is most associated with phenolic compounds.
	C	Saltiness is a taste that is mainly produced by chloride ions.	D	Sourness is related to acidity and is sensed by hydrogen ion channels in the human tongue.
62.	The product compartment of a refrigerator is maintained at 4°C by removing heat from it at a rate of 720 kJ/minutes. If the required power input to the refrigerator is 3kW, the COP of the refrigerator will be			
	A	4	B	3
	C	2	D	1
63.	A mild heat treatment of foods that destroys pathogens and extends its shelf life is called			
	A	Baking	B	Blanching
	C	Pasteurization	D	Sterilization
64.	Which product is termed as “the doctor” in confectionary?			
	A	MSG	B	Sorbitol
	C	Aspartame	D	Invertase
65.	During ripening of cheese by <i>Penicillium roqueforti</i> the characteristic aroma is because of			
	A	Methyl ketones	B	Acetoin
	C	Acetoacetic acid	D	Diacyetyl
66.	If temperature of a product increases, its water activity will			
	A	Decrease	B	Increase
	C	Will not change	D	May increase or decrease
67.	1 kg leafy vegetable is dried to yield 0.15 kg final product. Moisture removed during drying is			
	A	0.85 kg	B	25%

	C	85%	D	0.9 kg
68.	Which of the following is NOT classified as dietary fibre?			
	A	Pectin	B	Sodium alginate
	C	Agar	D	Tapioca starch
69.	Multi-layer food moisture content is			
	A	Not available for biological activities	B	In vapor form
	C	Undesirable	D	Available for biological activities
70.	Most common and least expensive plastic film used for packaging of solid food materials is			
	A	Polyethylene	B	Polystyrene
	C	Polypropylene	D	Polyvinylchloride
71.	Saccharomyces creavisiae is the example of			
	A	Bacteria	B	Yeast
	C	Fungi	D	Molds
72.	Green rot is caused by			
	A	Acinetobacter	B	Serratia spp.
	C	Proteus melanovogenes	D	Pseudomonas fluorescens
73.	In an actively growing (exponential phase) yeast culture, the cell concentration increased from 103 cells per ml to 107 cells per ml in 4 h. The doubling time of the yeast is			
	A	120 min	B	60 min
	C	30 min	D	18 min
74.	Ratio of strain to stress as a function of time is known as			
	A	Stress relaxation Modulus	B	Modulus Distribution function
	C	Creep compliance	D	None of the above
75.	Which of the following statements is NOT TRUE in case of oxidative rancidity of fatty foods?			
	A	Peroxides and hydroperoxides are formed during auto-oxidation	B	The final breakdown products of auto-oxidation are aldehydes, ketones and alcohols
	C	Auto-oxidation is a complex chain reaction	D	The reaction is brought about by an enzyme, called lipase
76.	According to FSSAI Regulations, market butter must contain at least what percentage of fat?			
	A	70%	B	>82%
	C	40%	D	80%
77.	Which type of bacteria grow best within the temperature range 55°C			
	A	Thermophilic	B	Mesophilic
	C	Psychrophilic	D	All the above
78.	Thermal destruction of microorganisms follows a kinetics of			
	A	Zero order	B	Fractional order
	C	First order	D	Second order
79.	Which of the following conditions for the heat resistance of microorganism is CORRECT?			
	A	Thermophiles > Psychrophiles > Mesophiles	B	Mesophiles < Thermophiles < Psychrophiles
	C	Psychrophiles > Mesophiles > Thermophiles	D	Psychrophiles < Mesophiles < Thermophiles
80.	If RH of air at a certain place is reported as 90% then			
	A	WBT = DBT	B	WBT > DBT
	C	WBT > DPT	D	WBT/DBT = 1
81.	$\lim_{x \rightarrow 0} \frac{x - \sin x}{x^3} =$			

	A	1/6	B	1
	C	-1/6	D	0
82.	The particular integral of $(D^2 + 1)y = \cos 5x$			
	A	$\frac{1}{24} \cos(5x)$	B	$\frac{1}{4} \cos(5x)$
	C	$-\frac{1}{24} \cos(5x)$	D	None of the above
83.	Two fair dice are rolled. What is the probability that the sum of the faces is a prime number?			
	A	$\frac{13}{36}$	B	$\frac{15}{36}$
	C	$\frac{17}{36}$	D	$\frac{1}{4}$
84.	A vector field which has a vanishing divergence is called as _____			
	A	Solenoidal field	B	Rotational field
	C	Hemispheroidal field	D	Irrotational field.
85.	The Eigen values of the matrix given below are $\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & -3 & -4 \end{bmatrix}$			
	A	0,-1,-3	B	0,-2,-3
	C	0,2,3	D	0,1,3
86.	The curl of vector field $\vec{f}(x, y, z) = x^2i + 2zj - yk$			
	A	-3i	B	-3j
	C	-3k	D	0
87.	The residue of the function $f(z) = \frac{1}{(z+2)^2(z-2)^2}$ at $z = 2$ is			
	A	-1/32	B	-1/16
	C	1/16	D	1/32
88.	The analytic function $f(z) = \frac{z-1}{z^2+1}$ has singularities at			

	A	1,-1	B	1,i
	C	1,-i	D	i, -i
89.	Which of the following is related with Stoke's theorem?			
	A	A surface integral and a volume integral	B	A line integral, a surface integral and a volume integral
	C	A line integral and a volume integral	D	A line integral and a Surface integral
90.	$L(t^2 \sin(3t))$.			
	A	$18 \frac{(s^2 - 3)}{(s^2 + 9)^3}$	B	$18 \frac{(s^2 - 3)}{(s^2 - 9)^3}$
	C	$\frac{(s^2 - 3)}{(s^2 + 9)^3}$	D	$18 \frac{(s^2 + 3)}{(s^2 + 9)^3}$
91.	The value of the integral $\oint_C \frac{-3z + 4}{(z^2 + 4z + 5)} dz$ where C is the circle $ z = 1$ is given by			
	A	1/10	B	0
	C	4/5	D	None of these
92.	If $f(x, y, z) = x^2 + y^2 + z - 9 = 0$ then the tangent plane at the point $P_0(1,2,4)$ is _____			
	A	$2x + 4y + z = 14$		$2x - 4y + z = 14$
	C	$2x + 4y - z = 14$		$2x + 2y + z = 14$
93.	The rank of the matrix $\begin{bmatrix} -4 & 1 & -1 \\ -1 & -1 & -1 \\ 7 & -3 & 1 \end{bmatrix}$ is			
	A	1	B	2
	C	3	D	4
94.	The value of $\iint_s (yz dy dz + zx dz dx + xy dx dy) : s = x^2 + y^2 + z^2 = 1$			
	A	0	B	4π
	C	$4\pi/3$	D	10π
95.	The partial differential equation $5 \frac{\partial^2 u}{\partial x^2} + 6 \frac{\partial^2 u}{\partial y^2} = xy$ is classified as			
	A	elliptic	B	parabolic
	C	hyperbolic	D	None of the above.
96.	The equation $f(x)$ is given as $x^3 - 13 = 0$. Considering the initial approximation $x_0 = 3.5$ then the value of next approximation by Newton Raphson technique will be.			

	A	2.687	B	2.678
	C	3.675	D	3.597
97.	Find the equations of normal line to the surface $x^2 + 2y^2 + z = 3$ at point (2,1,-3)			
	A	$\frac{x-2}{4} = -\frac{y-1}{1} = \frac{z+3}{1}$	B	$\frac{x-2}{8} = \frac{y-1}{1} = \frac{z+3}{1}$
	C	$\frac{x-2}{4} = \frac{y-1}{1} = \frac{z+3}{2}$	D	$\frac{x-2}{4} = \frac{y-1}{4} = \frac{z+3}{1}$
98.	The P (E) denote the probability of the event E. Given P(A) =1 ,P(B)=1/2 ,the values of P(A/B) and P(B/A) respectively are			
	A	1/4,1/2	B	1/2,1/4
	C	1/2, 1	D	1,1/2
99.	Arithmetic mean of 47 observation is 27 then sum of all the values is			
	A	1279	B	1249
	C	1259	D	None of the above
100	In which of the following methods, proper choice of initial value is very important?			
	A	Bisection method	B	False position
	C	Newton-Raphson	D	Bairsto method