

SUB: FOOD ENGINEERING (FE)

Seat No. _____

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.	Which of the following containing is the main cause of food poisoning on consumption of food?			
	A	Food spoilage bacteria	B	Enzymes and microorganisms
	C	Yeasts and moulds	D	Pathogenic bacteria
2.	Which of the following function of food packaging does Temperature – Time Indicator (TTI) covers?			
	A	Convenience	B	Containment
	C	Communication	D	Protection
3.	What is the sweetness of fructose with reference to glucose?			
	A	Same	B	Twice
	C	Thrice	D	None
4.	What is the proportion of horny to floury endosperm in dent corn?			
	A	1:2	B	2:1
	C	1:3	D	3:1
5.	Which parameter need to be considered while preservation of food?			
	A	Preservation length	B	Preservation cost
	C	Preservation method	D	Preservation ethics
6.	What is the critical temperature (°C) of conditioning of wheat which affects the baking quality of wheat flour?			
	A	45	B	<43
	C	44	D	>47
7.	Which of the following fatty acids do not belong to the category of 'Volatile fatty acid'?			
	A	Acetic Acid	B	Butyric Acid
	C	Capric Acid	D	None of the above

8.	Standardized milk contains minimum _____% milk fat and _____% SNF.			
	A	4.5, 8.5	B	4.5, 9.0
	C	3.5, 8.5	D	4.0, 8.5
9.	Which of the following food additive is added to table salt to prevent the caking?			
	A	Phosphoric acid	B	Calcium silicate
	C	Mono Sodium Glutamate	D	Benzoic acid
10.	Which is the most predominant pigment present in tomato?			
	A	Lycopene	B	Anthocyanin
	C	Xanthophyll	D	Beta carotene
11.	Which of the following is our body's best source of energy?			
	A	Fats, oil and sweets	B	Milk and cheese
	C	Cereals	D	Meat
12.	At isoelectric pH the proteins are in the form of _____.			
	A	Zwitterion	B	Cation
	C	Anion	D	Electron
13.	Which one of the following is used to make membrane filters?			
	A	Resins	B	Cellulose acetate
	C	Positively charge ion	D	Negatively charge ion
14.	Which of the following deterioration is responsible for moisture changes in food?			
	A	Biological	B	Physical
	C	Chemical	D	Microbial
15.	The optimum temperature for churning of cream is _____ °C.			
	A	5-10	B	0-5
	C	9-11	D	15-20
16.	The milk, cheese and yoghurt group are important for _____.			
	A	Teeth	B	Muscle
	C	Strong bones	D	All of the above
17.	Beany flavour in soybean is associated with _____.			
	A	Protease	B	Polyphenol
	C	Pectin methyl esterase	D	Lipoxygenase oxidase
18.	Which of the following statement is 'False'?			

	A	GRAS stands for 'generally recognized as safe'	B	Boric acid has been banned in foods.
	C	Food additives need not be numbered or labeled.	D	High levels of MSG leads to 'Chinese Restaurant Syndrome'.
19.	A deadly food borne illness from improperly canned foods is caused by _____.			
	A	<i>Clostridium perfringens</i>	B	<i>Clostridium botulinum</i>
	C	<i>Bacillus subtilis</i>	D	<i>A.niger</i>
20.	The relationship between an enzyme and a reactant molecule can best be described as _____.			
	A	Temporary association	B	Non complementary binding
	C	A permanent mutual alteration of structure	D	One in which the enzyme is changed permanently
21.	Cereals are generally deficient in _____.			
	A	Methionine	B	Valine
	C	Tryptophan	D	Lysine
22.	The typical flavour of butter obtained from ripened cream is mainly due to _____.			
	A	Propionic acid	B	Lactic acid
	C	Acetic acid	D	Diacetyl
23.	Which of the following sugar is synthesized in the mammary gland of animals and hydrolyze to make lactose?			
	A	Sucrose	B	Galactose
	C	Fructose	D	Glucose
24.	Which is the most essential constituent in fruit jelly formation?			
	A	Starch	B	Cellulose
	C	Pectin	D	Amylose
25.	The butter starter culture contain _____ as a acid producing microorganism.			
	A	<i>Streptococcus cremoris</i>	B	<i>Streptococcus diacetilactis</i>
	C	<i>Leuconostoc citrovorum</i>	D	<i>Leuconostoc dextranicum</i>
26.	Which of the following step during chocolate processing promotes flavour development through frictional heat, release of volatiles and oxidation?			
	A	Cooling	B	Mixing
	C	Conching	D	Enrobing
27.	Which one of the following is the ideal cleaning material for removing food stone from equipment surfaces?			
	A	Surfactant	B	Acidic detergent

	C	Chelating agent	D	Wetting agent
28.	The concept of overall coefficient of heat transfer is used in case of heat transfer by _____.			
	A	Conduction	B	Convection
	C	Radiation	D	Conduction and Convection
29.	_____ is a physical method used to control food deterioration is called cold sterilization process.			
	A	Irradiation	B	Alcoholic fermentation
	C	Cooling	D	Salting
30.	Which of the following concept is mainly used in low acid canned foods?			
	A	6D	B	12D
	C	18D	D	20D
31.	Non enzymatic browning reactions occurs in between _____.			
	A	Amino acid and ascorbic acid	B	Sugars and ascorbic acid
	C	Amino acid and sugars	D	Polyphenols and oxygen
32.	Which of the following phenomena observed in non competitive inhibitor of an enzyme catalyzed reaction?			
	A	Decreases Vmax	B	Inhibitor will not bind an active site
	C	Km remains same	D	All of the above
33.	In which of the following equipment heat is transferred by all the three modes i.e. conduction, convection and radiation?			
	A	Steam condenser	B	Electric heater
	C	Boiler	D	None of the above
34.	In stand alone CIP system _____ is used for taking water.			
	A	Piping network	B	Balance tank
	C	Processing circuit	D	Return valves
35.	At what temperature ($^{\circ}\text{C}$) the bleaching of oil is carried out?			
	A	70-80	B	85-95
	C	100-110	D	110-120
36.	In tea fermentation the oxidation process of tea leaves are initiated by _____.			
	A	Tea microorganism	B	Moisture
	C	Mixing	D	Tea enzyme
37.	Which value describes the level of microbial destruction obtained by thermal treatment?			
	A	Thermal death time	B	Z value
	C	F0 value	D	D value
38.	Calcium propionate is _____.			
	A	Moistening agent	B	Leavening agent
	C	Mould inhibitor	D	Antioxidant

39.	Choose the correct statement for acidophilus milk.			
	A	Provides relief from indigestion and diarrhea	B	Has a less shelf life than ordinary milk
	C	<i>Lactobacillus bulgaricus</i> used as a starter culture	D	All of the above
40.	Monosaccharide molecules that can rotate the plane of plane polarized light to right are called _____.			
	A	Dextrose sugars	B	Pentose sugars
	C	Simple sugars	D	Hexose sugars
41.	According to FSSAI regulations, oil extracted by solvent extraction method should not contain more than _____ ppm hexane.			
	A	2	B	5
	C	10	D	15
42.	Which of the following QAC is most commonly used for sanitization?			
	A	Anionic	B	Cationic
	C	Non ionic	D	Bipolar
43.	The deficiency of carbohydrate and protein in infants leads to _____.			
	A	Goitre	B	Phyrioderma
	C	Marasmus	D	Obesity
44.	Which of the following sugar alcohol has same relative sweetness as sugar?			
	A	Xylitol	B	Sorbitol
	C	Mannitol	D	Dulcitol
45.	At what temperature (°C) NaOH is added during neutralization of oil?			
	A	40	B	60
	C	80	D	100
46.	What is the basis used for the classification of wheat?			
	A	Protein	B	Fat
	C	Carbohydrate	D	Texture
47.	Which one of the following chemical has good germicidal action?			
	A	Nitric acid	B	Trisodium Phosphate
	C	Caustic soda	D	Soda ash

48.	Which of the following is true about scraped surface crystallizers?			
	A	Expansion of capacity is easy	B	Smaller size, less installation cost
	C	Can be used for a wide range of temperature differences	D	All of the above
49.	Cocoa Beans dried to below_____ % moisture become quite brittle and are easily damaged in subsequent handling.			
	A	6	B	2
	C	10	D	20
50.	What is the purpose of scratching/pitting of grains in pulse milling?			
	A	To soften the grains	B	Maximum diffusion of oil within the grains
	C	To dehusk the grain	D	None of the above
51.	In rice milling, which of the following has commercial importance?			
	A	Head rice yield	B	Total yield
	C	Field yield	D	All are equally important
52.	All the following techniques are household preservation techniques except _____.			
	A	Salting	B	Dehydration
	C	Lyophilization	D	Smoking
53.	Which of the following is not example of essential amino acid?			
	A	Threonine	B	Glycine
	C	Methionine	D	Phenylalanine
54.	What should be the acidity (%) and TSS (^o Brix) of Pineapple squash?			
	A	Acidity 1, TSS 45.	B	Acidity 0.5,TSS 35.
	C	Acidity 0.5, TSS 45.	D	Acidity 1, TSS 35.
55.	Which of the following nutrient is most important for healthy vision?			
	A	Vit. A	B	Vit. C
	C	Iron	D	Zinc
56.	Why metal containers remain frequently used package for canning foods?			
	A	It is opaque	B	It has high conductivity of heat

	C	It can withstand the stresses imposed during thermal processing and cooling	D	All of the above
57.	Which of the following spice is known as king of spice?			
	A	Basil	B	Pepper
	C	Aniseed	D	Chilli
58.	Which of the following needs to be taken care of during scale up of crystallizers?			
	A	Reynolds number	B	Power supplied to agitator per unit volume
	C	Residence time	D	All of the above
59.	What is the fat content of cocoa butter processed from dried cocoa beans?			
	A	20-25 %	B	10-15 %
	C	35-37 %	D	56-58 %
60.	In _____ polish, water and oil is applied on the dal.			
	A	Nylon	B	Buff
	C	Water	D	None of the above
61.	If 35 g of a liquid occupies 25 cm ³ in a measuring cylinder, what is the density of the liquid?			
	A	0.20 g cm ⁻³	B	0.4 g cm ⁻³
	C	1.4 g cm ⁻³	D	0.8 g cm ⁻³
62.	Suspension of starch in water shows which type of flow?			
	A	Newtonian	B	Plastic
	C	Dilatant	D	Pseudoplastic
63.	What is the source of grease as a contaminant in food?			
	A	Operator	B	Bird
	C	Machine	D	Animal
64.	Which protein is found in egg white?			
	A	Ovalbumin	B	Lactalbumin
	C	Glutelins	D	None
65.	The shelling of paddy in rubber roll sheller is due to _____.			
	A	Rubbing	B	Crushing
	C	Shearing	D	None of the above
66.	Which of the following is not an example of climacteric fruit?			
	A	Apple	B	Banana
	C	Mango	D	Grapes
67.	In most of the juices the major portion of TSS comprises of _____.			
	A	Salt	B	Sugar
	C	Vitamin	D	Mineral
68.	Which of the following food additive is natural preservative?			
	A	Na Benzoate	B	Ca Propionate
	C	NaCl	D	None of the above
69.	Which fluids are having a constant viscosity dependent on temperature but independent of the applied shear rate?			
	A	Emulsion	B	Newtonian

	C	Non Newtonian	D	None of the above
70.	Tomato fruits for canning are harvested at _____.			
	A	Red ripe stage	B	Mature green stage
	C	Immature green stage	D	Half-ripe/pink stage
71.	_____ is a method of preventing or reducing the pathogens in food product by combining methods during processing.			
	A	Hurdle technology	B	Mixed food preservation
	C	High pressure processing	D	Stumbling technology
72.	Which of the following is not true about monosaccharides?			
	A	They are white crystalline solids	B	They have sweet taste
	C	They are soluble in water	D	They can be hydrolyzed
73.	Which unit operation is responsible to correct the contents of can during canning?			
	A	Clinching	B	Sorting
	C	Syruping	D	None of the above
74.	Which of the following process do not contribute towards textural changes during ripening?			
	A	Change in pectin composition	B	Degradation of chlorophyll
	C	Change in other cell wall components	D	Softening of texture
75.	First cleaning operation of paddy after threshing is called _____.			
	A	Scalping	B	Cleaning
	C	Fumigation	D	All of the above
76.	On psychrometry chart vertical upward line represent the _____.			
	A	Sensible heating	B	Humidification
	C	Sensible cooling	D	Dehumidification
77.	Which solvent is used for the extraction of oleoresin from ground spices?			
	A	Alcohol	B	Petroleum ether
	C	Acetic acid	D	Acetone
78.	A dilute solution of _____ is called lye solution.			
	A	KOH	B	NaOH
	C	CuOH	D	KMNO ₄
79.	Which of the following is not the driving force in filtration?			
	A	Temperature	B	Gravity
	C	Pressure	D	Vacuum
80.	Why resins are added to paper?			
	A	To improve gloss	B	To improve printability
	C	To improve opacity	D	All of the above
81.	Which of the following differential equations is equivalent to $\frac{d}{dx}(e^x y) = x^3 e^x$?			

	A	$\frac{dy}{dx} = x^3 - y$	B	$\frac{dy}{dx} + (e^x y) = x^3 - y$
	C	$e^x \frac{dy}{dx} = x^3 - y$	D	None of these
82.	$\frac{dy}{dx} + 2x y - x^2 = 0$ has the integration factor.....			
	A	e^{-x^2}	B	e^{x^2}
	C	e^x	D	e^{-x}
83.	The differential equation $5 \frac{d^2 y}{dx^2} + 3 \frac{dy}{dx} + 2y = x^4$ is			
	A	first order linear	B	first order non linear
	C	second order linear	D	second order non linear
84.	An equation of the form $x^2 \frac{d^2 y}{dx^2} + x \frac{dy}{dx} + y = 0$ is differential equation.			
	A	Legendre's	B	Riemann's
	C	Bessel's	D	Euler-Cauchy
85.	The general solution of $\frac{d^4 y}{dx^4} + 18 \frac{d^2 y}{dx^2} + 81y = 0$ is.....			
	A	$y = (c_1 + c_2) \cos 3x + (c_3 + c_4) \sin 3x$	B	$y = c_1 \cos 3x + c_2 \sin 3x$
	C	$y = (c_1 + c_2 x) \cos 3x + (c_3 + c_4 x) \sin 3x$	D	None of these
86.	The harmonic conjugate of $u(x, y) = x^2 - y^2$ is.....			
	A	$y^2 - x^2$	B	$2xy$
	C	$(x^2 - y^2)i$	D	None of these
87.	$\oint_C \frac{dz}{z} = \text{.....}$, where c is a unit circle			
	A	πi	B	$4\pi i$
	C	1	D	$2\pi i$
88.	The Laplace transform of $e^{-2t}(\cos 3t - \sin 3t)$ is.....			

	A	$\frac{s-2}{s^2+4s+13}$	B	$\frac{s-1}{s^2+4s+13}$
	C	$\frac{s+1}{s^2+4s+13}$	D	None of these
89.	$L\left(\int_0^t (t^5 + \sin 3t) dt\right)$ equals			
	A	$\frac{120}{s^7} + \frac{3}{s(s^2+9)}$	B	$\frac{120}{s^6} + \frac{3}{s^2+9}$
	C	$\frac{1}{s^7} + \frac{3}{s(s^2+9)}$	D	not defined
90.	The positive roots of $f(x) = x - \cos x$ lies in the interval.....			
	A	(1, 2)	B	(-3, -2)
	C	(0, 1)	D	(2, 5)
91.	In Newton-cotes formula, if $f(x)$ is interpolated at equally spaced nodes by a polynomial of degree two then it represents.....			
	A	trapezoidal rule	B	Simpson's one-third rule
	C	Simpson's three-eighth rule	D	Weddle's rule
92.	The solution of the system equations $3x + y + 2z = 3$, $2x - 3y - z = -3$, $x - 2y + z = -4$ is			
	A	(2, 4, 6)	B	(1, 1, 1)
	C	(1, 2, 3)	D	(1, 2, -1)
93.	A binomial random variable has $n = 20$ and $p = 0.3$. Then the value of $\sum x^2 p(x) = ?$			
	A	40.1	B	40.2
	C	36	D	36.2
94.	The limiting relative frequency approach of probability is known as			
	A	Statistical probability	B	Classical probability
	C	Mathematical probability	D	All the above
95. is the value which occurs most frequently in a set of observations and around which the other items of the set are heavily distributed.			

	A	Mean	B	median
	C	third quartile	D	mode
96.	If $A = \begin{bmatrix} 3 & 0 \\ 8 & -1 \end{bmatrix}$ then the eigen values of $A+2I$ are....., where I is a 2×2 identity matrix.			
	A	5, 1	B	3, -1
	C	-3, 1	D	-3, -1
97.	$\int_0^{\infty} e^{-x^2} x^3 dx$ equals to.....			
	A	$\frac{\sqrt{\pi}}{2}$	B	$\sqrt{\pi}$
	C	$\frac{1}{2}$	D	$\frac{\pi}{2}$
98.	The function $f(x, y) = x^3 + y^3 - 3x - 12y + 20$ has local minima at			
	A	(-1, -2)	B	(-1, 2)
	C	(1, -2)	D	(1, 2)
99.	The vector field $\vec{F} = (4x - 2y + z)\hat{i} + (2x + ay - z)\hat{j} + (x - y + z)\hat{k}$ is solenoidal, if $a = \dots$			
	A	-5	B	5
	C	-4	D	-1
100.	The directional derivative of $x^2y^2z^2$ at (1, 1, -1) along the direction equally inclined with coordinate axes is			
	A	$\frac{2}{3}$	B	$\frac{6}{\sqrt{3}}$
	C	$\frac{2}{\sqrt{3}}$	D	2