

Q.1. The major protein in corn is....

- A) Oryzenin B) Glutenin C) Zein D) Hordenin

Q.2. Which of the following is not a reducing sugar?

- A) Lactose B) Mannose C) Maltose D) Sucrose

Q.3. Which of the following is an intrinsic factor influencing microbial growth in food?

- A) Temperature B) Relative humidity C) Nutrients D) Gas composition

Q.4. Which of the following combination of starter culture is mostly used for the production of yoghurt?

- A) Lactobacillus casei and Lactobacillus delbrueckii  
 B) Lactobacillus delbrueckii and Streptococcus thermophilus  
 C) Lactobacillus acidophilus and Leuconostoc mesenteroides  
 D) Streptococcus thermophilus and Leuconostoc mesenteroides

Q.5. Potassium bromate is used to improve the gluten quality of wheat dough by increasing

- A) protein-protein ester linkage  
 B) protein-protein disulphide linkage  
 C) protein-protein interaction with large number of H-bonds  
 D) protein-starch interaction with large number of H-bonds

Q.6. Which of the following substance is **NOT** a Class I preservative in food

- A) Vinegar B) Sodium benzoate C) Vegetable oils D) Citric acid

Q.7. Saturated steam at temperature  $T_s$  ( $^{\circ}\text{C}$ ) flows through a pipe and atmospheric air flows over the outer surface of the pipe. If the temperature of the air has increased from  $T_i$  to  $T_o$ , the effectiveness of the heat exchange can be expressed as

- A)  $\frac{T_s - T_i}{T_s - T_o}$       B)  $\frac{T_s - T_o}{T_s - T_i}$       C)  $\frac{T_o - T_i}{T_s - T_i}$       D)  $\frac{T_o - T_i}{T_s - T_o}$

Q.8. Convection mass transfer coefficient of water vapour diffusing from a water surface to air depends primarily on

- A) Velocity of air      B) Viscosity of water vapour  
 C) Density of water vapour      D) Specific heat of water vapour

Q.9. The following was obtained from an analysis of two oil samples A and B

- a) Iodine value of A is greater than iodine value B  
 b) Reichert Meissl value of A is less than Reichert Meissl value B

Based on the above analysis, the following is the correct statement

- A) Oil A is more unsaturated than oil B and has low molecular weight fatty acids  
 B) Oil A is less unsaturated than oil B and has low molecular weight fatty acids

- C) Oil A is less unsaturated than oil B and has high molecular weight fatty acids  
 D) Oil A is more unsaturated than oil B and has high molecular weight fatty acids

Q.10. Match the following.

Group 1	Group 11
(P) Iodine	(1) Biotin
(Q) Curing salt	(2) Flavour enhancer
(R) Avidin	(3) Goitre
(S) Mono sodium glutamate	(4) Sausage
	(5) Anemia

- A) P-3,Q-4,R-1,S-2      B) P-5,Q-4,R-1,S-2  
 C) P-3,Q-4,R-5,S-2      D) P-5,Q-2,R-1,S-4

Q.11. Protein denaturation is a phenomenon of change in three dimensional structure of protein, and consequently an alteration of its functionality. Which of the following statement is not related to protein denaturation?

- A) Accessibility of proteolytic enzyme to peptide bonds increases  
 B) Solubility and enzymatic activity of native protein decrease  
 C) Intrinsic viscosity and optical rotation of the protein solution increase  
 D) Increase in the intrinsic viscosity through formation of amino acids by hydrolysis

Q.12. If  $V$  is the reaction rate,  $V_{max}$  is the maximum reaction rate,  $K_m$  is the Michaelis-Menton constant and  $[S]$  is the substrate concentration, the Lineweaver-Burk plot for NO INHIBITION enzymatic reaction can be written as

A)  $\frac{1}{V} = \frac{K_m}{V_{max}} \frac{1}{[S]} + \frac{1}{V_{max}}$       B)  $\frac{1}{V} = \frac{K_m[S]}{V_{max}} + \frac{1}{V_{max}}$   
 C)  $\frac{1}{V} = \frac{K_m}{V_{max}} + \frac{[S]}{V_{max}}$       D)  $\frac{1}{V} = \frac{K_m}{V_{max}} + \frac{[S]^2}{V_{max}}$

Q.13. The specific growth rate of Bacillus cereus in a food sample is  $0.4 \text{ h}^{-1}$ . Doubling time of the cell is

- A) 2 h    B) 1.73 h    C) 1.25 h    D) 1 h

Q.14. Match the following.

Group 1	Group 11
P)PER	1)Jelly
Q)Synerisis	2) Essential amino acids
R) Soyabean	3) Neral
S) Lemon	4) Saponin
	5) Lycopene

- A) P-2,Q-1,R-4, S-5      B) P-2,Q-1,R-5,S-4  
 C) P-2,Q-1,R-4,S-3      D) P-5,Q-1,R-4 S-3

Q.15. Match the following.

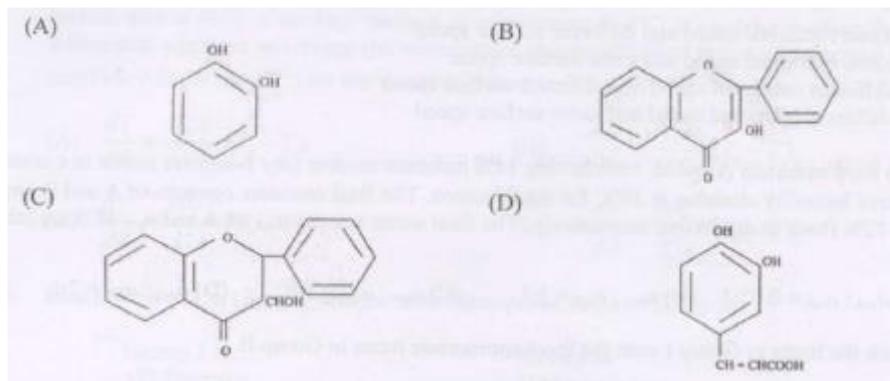
Group 1	Group 11
P) Cheese	1) Hydrogen Peroxide
Q) Enterotoxin B	2) Nisin
R) Bacteriocin	3) Propionibacterium
S) Milk ropiness	4) Alcaligenes
	5) Staphylococcus aureus

- A) P-5,Q-1,R-2,S-4      B) P-3,Q-1,R-5,S-4  
 C) P-3,Q-5,R-2,S-4      D) P-3,Q-5,R-2,S-1

Q.16. Five grams of cheese was mixed with 45 ml of sterile diluent. Two successive dilutions of 1:100 each were made and one-tenth millilitre from the last dilution was plated onto each of two plates containing plate count agar medium. Following incubation, 56 colonies were counted on one plate and 54 on the other. The average number of colony forming units per gram of cheese is

- A)  $5.5 \times 10^5$     B)  $5.5 \times 10^6$     C)  $5.5 \times 10^7$     D)  $5.5 \times 10^8$

Q.17. Which of the following is the structure of flavonol?



Q.18. Match the following

Group 1	Group 11
P) Spore former	1) Listeria
Q) Vinegar	2) Shigella
R) Psychrotroph	3) Lactobacillus
S) Dysentery	4) Bacillus
	5) Acetobacter

- A) P-3,Q-5,R-4,S-2      B) P-4,Q-5,R-1,S-2  
 C) P-4,Q-5,R-1,S-3      D) P-4,Q-3,R-1,S-2

Q.19. Development of 'hot spot' in high moisture grain during storage in silo is due to

- A) Exothermic reaction between moisture and starch present in the endosperm of the grain  
 B) Microbial growth and respiration of grain

- C) Heating of the silo wall during day and cooling during night
- D) Exothermic reaction between the moisture present in endosperm and the oil in germ

Q.20. In modern rice mills, the two rubber rolls in the sheller rotate in opposite direction at

- A) Same rotational speed and different surface speed
- B) Same rotational speed and same surface speed
- C) Different rotational speed and different surface speed
- D) Different rotational speed and same surface speed

Q.21. Two food materials A and B, each having 14% moisture content(dry basis) are stored in a constant RH chamber at 30°C for equilibration. The final moisture content of A and B are 6%(db) and 12%(db) respectively. The final water activity  $a_{wA}$  of A and  $a_{wB}$  of B are related as

- A)  $a_{wA}:a_{wB}=0.65:1$
- B)  $a_{wA}:a_{wB}=1:1$
- C)  $a_{wA}:a_{wB}=1:2$
- D)  $a_{wA}:a_{wB}=2:1$

Q.22. Rigor mortis in meat is due to

- A) Glycolysis followed by formation of lactic acid
- B) Binding of collagen and elastin
- C) Action of cathepsin enzyme in meat
- D) Binding of myosin and actin

Q.23. Match the following

Group 1

- P) Disc centrifuge
- Q) Multiple effect evaporator
- R) UHT processing
- S) Homogenization

Group 11

- 1) Separation of solid phase in milk by coagulation
- 2) Aseptic packaging of milk
- 3) Separation of liquid phase in milk
- 4) Dispersion of one of the liquid phase in milk
- 5) Concentration of milk

A) P-3,Q-5,R-1,S-4    B) P-1,Q-5,R-2,S-4

C) P-3,Q-5,R-2,S-1    D) P-3,Q-5,R-2,S-4

Q.24. 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 equipment used in UHT processing of milk is

- A) P-Q-R-S-P
- B) P-Q-R-Q-S-P
- C) P-Q-R-P
- D) P-Q-S-P

Q.25. Following operations are adopted for refining of vegetable oils

P: Winterization, Q: Alkali refining, R: Steam deodorization, S: Bleaching, T: Degumming. The correct sequence of operations for refining is

- A) P-Q-T-R-S
- B) S-R-Q-P-T
- C) T-Q-S-R-P
- D) R-T-Q-S-P

Q.26. A liquid having density  $\rho$  and viscosity  $\mu$  flows under laminar condition through a circular pipe having diameter D and length L against a pressure drop of  $\Delta P$ . Volume flow rate of liquid through the pipe will be proportional to

- A)  $\frac{D^4 \Delta P \rho}{\mu L}$
- B)  $\frac{D^2 \Delta P}{\rho \mu L}$
- C)  $\frac{D \Delta P \rho}{\mu L}$
- D)  $\frac{D^4 \Delta P}{\mu L}$

Q.27. A liquid having mass  $M(\text{kg})$ , heat capacity  $C_p (\text{Jkg}^{-1}\text{.}^{\circ}\text{C}^{-1})$  is cooled in an agitated vessel having surface area  $A(\text{m}^2)$ . A cooling medium at temperature  $T_s(^{\circ}\text{C})$  is used for cooling the liquid. The differential equation governing the temperature change  $dT/d\theta$  of liquid with overall heat transfer coefficient  $U (\text{W.m}^{-2}\text{.}^{\circ}\text{C}^{-1})$  for the vessel is given by

A)  $\frac{dT}{d\theta} = \frac{UA}{MC_p} (T_s - T)$

B)  $-\frac{dT}{d\theta} = \frac{UA}{MC_p} (T_s - T)$

C)  $\frac{dT}{d\theta} = \frac{MC_p}{UA} (T_s - T)$

D)  $-\frac{dT}{d\theta} = \frac{MC_p}{UA} (T_s - T)$

Q.28. Match the following

Group 1

P) Freezing

Q) Fat globules movement in milk

R) Flow through packed bed

S) Boiling temperature

Group 11

1) Stokes law

2) Planks equation

3) Erguns equation

4) Hagen poiseulis equation

5) Roults law

A) P-4,Q-1,R-3,S-5    B) P-2,Q-1,R-3,S-4

C) P-2,Q-1,R-4,S-5    D) P-2,Q-1,R-3,S-5

Q.29 &30. Milk having heat capacity  $3900 \text{ Jkg}^{-1}\text{.}^{\circ}\text{C}^{-1}$  and density  $1020 \text{ kgm}^{-3}$  is pressurized to 300atm gauge pressure and allowed to flow through a high pressure homogenizing valve at a rate of 60 litres/min. the diameter of the homogenizing valve through which the milk flows is 6mm. (1atm=101.3 KPa)

A) Temperature rise in milk will be.....1)10.1  $^{\circ}\text{C}$  2)9.2 $^{\circ}\text{C}$  3)7.7 $^{\circ}\text{C}$  4)6.1 $^{\circ}\text{C}$

B) Height of the valve lift will be.....1) 0.06mm 2)0.11mm 3)0.16mm 4)0.22mm

Q.31 &32. Compressed ait at 0.5 atm gauge pressure and 30 $^{\circ}\text{C}$  contains 0.01 kg water vapour per kg dry air .Molecular weight of dry air and water vapour are 28.9 and 18 kg.kmol $^{-1}$ , respectively. Saturation vapour pressure of air at 30 $^{\circ}\text{C}$  is 4.246kpa absolute.

A) Partial pressure of water vapour inside the compressor is...1)2.15kPa 2)2.40kPa 3)3.12kPa 4)3.51 kPa

B) Relative humidity of air inside the compressor is.....1)40.1% 2)49.8% 3)56.5% 4)57.6%

Q.33 &34. A medium acid food is sterilized at 100 $^{\circ}\text{C}$  in a can to reduce the number of heat resistant organism ( $D_{120}=0.2 \text{ min}$ ;  $Z=10^{\circ}\text{C}$ )from an initial count of 10000 per can to a probability of survival of 1 in million.

A)  $D_{100}$  value of this organism is....1)0.4 min B)20 min C) 4min D)10 min

B) The total processing time is.....1)100 min 2)40 min 3)200 min 4) 4min