G : FOOD TECHNOLOGY

Q. 1 – Q. 9 carry one mark each.

Q.1 Standard pasteurization protocol for milk is adequate for destroying

(A) *Clostridium sporogenes* (B) *Bacillus cereus*
(C) *Clostridium botulinum* (D) *Listeria monocytogenes*

Q.2 Which one of the following is NOT a component of an evaporator?

(A) Heat exchanger (B) Vacuum separator
(C) Condenser (D) Cyclone separator

Q.3 Among the following animal foods, the fat content is least in

(A) Beef (B) Chicken meat (C) Pork (D) Lamb flesh

Q.4 The enzyme that hydrolyzes starch to maltose is

(A) α-amylase (B) β-amylase
(C) glucoamylase (D) cyclodextrin glucanotransferase

Q.5 Which one of the following is NOT enriched in endosperm during parboiling of paddy?

(A) Thiamine (B) Niacin (C) Iron (D) Fat

Q.6 Heat-treated legume seed proteins are more digestible than those of untreated legume seed proteins due to

(A) reaction of reducing sugars with ε-amino group of lysine
(B) increased binding of lectins to intestinal mucosal cells
(C) thermolabile nature of lectins and Kunitz-type protease inhibitors
(D) thermolabile nature of Bowman-Birk type of inhibitor

Q.7 What is the percent relative humidity at which both the dry bulb and wet bulb thermometers would record equal temperatures?

(A) 0 (B) 10 (C) 50 (D) 100

Q.8 How many fold would the *g*-number of a centrifuge increase by doubling both the spinning speed and bowl diameter?

(A) 2 (B) 4 (C) 8 (D) 16

Q.9 The gradual decrease in viscosity of tomato paste during storage can be prevented by quickly heating it to 82 °C, because

(A) water soluble pectin interacts with calcium
(B) hemicellulose prevents decrease in viscosity
(C) lignin prevents decrease in viscosity
(D) pectin methyl esterase is inactivated

Q. 10 – Q. 22 carry two marks each.

Q.10 Match the enzyme in **Group I** with its corresponding application in **Group II**

Group I	**Group II**
(P) Chymosin	(1) Removal of cooked flavor from milk
(Q) Sulfhydryl oxidase	(2) Soybean milk coagulation
(R) β–Galactosidase	(3) For rennet puddings
(S) Microbial proteases	(4) Lactose removal

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

Q.11 Milk is flowing at 0.12 m^3/min in a 2.5 cm diameter pipe. The temperature of the milk is 21 °C and the corresponding viscosity and density are 2.1 x 10^{-3} Pas and 1029 kg/m^3, respectively. If the flow is found to be turbulent under the given conditions, the Reynolds number is _____

Q.12 Whole milk (34,950 kg) containing 4% fat is to be separated in 6 h period into skim milk with 0.45% fat and cream with 45% fat. The flow rate of cream stream (kg/h) from the separator is _____

Q.13 Match the edible plant tissue in **Group I** with the type of carotenoid given in **Group II**

Group I	**Group II**
(P) Corn	(1) Lycopene
(Q) Red pepper	(2) β-Carotene
(R) Pumpkin	(3) Capsanthin
(S) Tomato	(4) Lutein

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

Q.14 Undesirable bitterness frequently encountered in cured cheese is due to the

(A) presence of naringen
(B) formation of limonin
(C) overall hydrophobicity of amino acid side-chains in peptide
(D) conversion of humulone to isohumulone

Q.15 Green tea is considered to be a more healthy option than black tea because it

(A) has high content of polyphenols
(B) is richer in thearubigin
(C) does not require any sweetener during tea preparation
(D) has no microbial load

Q.16 Multiple effect evaporation leads to

(A) reduction in operating cost and reduction in capital cost
(B) increase in operating cost and increase in capital cost
(C) increase in operating cost and reduction in capital cost
(D) reduction in operating cost and increase in capital cost

Q.17 A dilute pineapple juice is heated in a double pipe heat exchanger from 28 °C to 75 °C by heat exchanging with hot water flowing in shell in counter current direction. Hot water is entering the shell at 95 °C and leaving at 85 °C. The log mean temperature difference (°C) is _____

Q.18 Heat is transferred by radiation to a loaf of bread in an oven at a uniform temperature of 177 °C. The total surface area and temperature of the loaf are 0.0645 m^2 and 100 °C, respectively. The surface emissivity of the loaf is 0.85 and the value of Stefan-Boltzmann constant is 5.73×10^{-8} $J.m^{-2}.k^{-4}$. The net heat transfer (W) is _____

Q.19 Granulated sugar, having an average particle size of 500 µm, is milled to produce icing sugar having an average particle size of 25 µm. The power requirement was 10 kW as obtained by Rittinger's law. If the same mill were to be used to produce fondant sugar having an average particle size of 20 µm at the same capacity, the power requirement (kW) would be _____

Q.20 One ton of soybean containing 18% oil, 35% protein, 27.1% carbohydrates, 9.4% of fibre and ash, and 10.5% moisture is crushed and pressed. The residual oil content in the pressed cake is 6%. Assuming that there is no loss of protein and water with oil, the amount of oil (kg) obtained from the crusher is _____

Q.21 Match the processing method in **Group I** with the operation carried out in **Group II**

Group I	**Group II**
(P) Degumming	(1) Crystallization of triacylglycerol by cooling to remove fat crystals
(Q) Deacidifying	(2) Passing heated oil over charcoal
(R) Bleaching	(3) Using alkaline solution to remove fatty acids
(S) Winterizing	(4) Wetting with water to remove lecithin

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

Q.22 The order of succession of microbes in the spoilage of milk, involving (P) *Lactobacillus*, (Q) protein digesting bacteria, (R) *Lactococcus lactis*, (S) yeasts and molds, is

(A) S>R>Q>P (B) S>Q>R>P (C) R>P>S>Q (D) Q>S>P>R

END OF THE QUESTION PAPER