

Q. 1 – Q. 10 carry one mark each & Q.11 - Q.20 carry two marks each.

Q.1 Which of the following is an oil soluble pigment present in fruits and vegetables?

- (A) Flavonoids (B) Carotenoids (C) Anthocyanins (D) Tannins

Q.2 Which of the following represent the group of saturated fatty acids?

- (A) Lauric, Myristic, Arachidic (B) Palmitic, Linoleic, Linolenic
(C) Capric, Stearic & Oleic (D) Behenic, Caprylic, Arachidonic

Q.3 The anti-nutritional factor present in fava bean is

- (A) Gossypol (B) Curcine
(C) Vicine (D) Cyanogen

Q.4 Which of the following is a Gram positive bacteria?

- (A) *Listeria monocytogenes*
(B) *Proteus vulgaris*
(C) *Salmonella typhi*
(D) *Shigella dysenteriae*

Q.5 Irradiation carried out to reduce viable non-spore forming pathogenic bacteria using a dose between 3 to 10 kGy is

- (A) Radurization (B) Thermoradiation
(C) Radappertization (D) Radicidation

Q.6 Identify the correct statement related to the viscosity of Newtonian fluids from the following.

- (A) It is not influenced by temperature
(B) It increases with shearing rate
(C) It decreases with shearing rate
(D) It is not influenced by shearing rate

- Q.7 Adult male Wistar rats were fed with a protein based diet. Total 150 g of protein was ingested per animal. If the average weight increased from 110 g to 350 g after the end of experiment, the Protein efficiency ratio of the given protein would be _____. (up to two decimal points).
- Q.8 The initial moisture content of a food on wet basis is 50.76%. Its moisture content (%) on dry basis is _____.(up to two decimal points)
- Q.9 The oxygen transmission rate through a 2.54×10^{-3} cm thick low density polyethylene film with air on one side and inert gas on the other side is 3.5×10^{-6} mL cm⁻² s⁻¹. Oxygen partial pressure difference across the film is 0.21 atm. The permeability coefficient of the film to oxygen is _____ x 10⁻¹¹ mL (STP) cm cm⁻² s⁻¹ (cm Hg)⁻¹.
- Q.10 Ambient air at 30°C dry bulb temperature and 80% relative humidity was heated to a dry bulb temperature of 80°C in a heat exchanger by indirect heating. The amount of moisture gain (g kg⁻¹ dry air) during the process would be _____.

Q. 11 – Q. 20 carry two marks each.

- Q.11 Match the commodity in **Group I** with the bioactive constituent in **Group II**

Group I

- P. Ginger
Q. Green tea
R. Spinach
S. Turmeric

Group II

1. Lutein
2. Gingerol
3. Curcumin
4. Epigallocatechin gallate

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

- Q.12 Match the process operation in **Group I** with the separated constituent in **Group II**

Group I

- P. Extraction
Q. Degumming
R. Neutralization
S. Bleaching

Group II

1. Phospholipids
2. Free fatty acids
3. Pigments
4. Crude oil

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

Q.13 Match the spoilage symptom in **Group I** with the causative microorganism in **Group II**

Group I

- P. Green rot of eggs
- Q. Putrid swell in canned fish
- R. Red bread
- S. Yellow discoloration of meat

Group II

- 1. *Micrococcus* spp.
- 2. *Serratia marcescens*
- 3. *Pseudomonas fluorescens*
- 4. *Clostridium sporogens*

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

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

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

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

Q.14 Match the fermented product in **Group I** with the base material in **Group II**

Group I

- P. Sake
- Q. Chhurpi
- R. Natto
- S. Sauerkraut

Group II

- 1. Milk
- 2. Cabbage
- 3. Rice
- 4. Soybean

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

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

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

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

Q.15 Match the operation in **Group I** with the process in **Group II**

Group I

- P. Cleaning
- Q. Grading
- R. Size reduction
- S. Filtration

Group II

- 1. Quality separation
- 2. Clarification
- 3. Screening
- 4. Comminution

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

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

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

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

Q.16 Out of 7 principles of HACCP system, 4 are listed below. Arrange these principles in the order in which they are applied.

- (P) Conduct a hazard analysis
- (Q) Establish monitoring process
- (R) Establish critical limit
- (S) Establish record keeping and documentation process

(A) P, R, Q, S

(B) Q, R, P, S

(C) P, Q, R, S

(D) R, S, P, Q

- Q.17 Identify an example of a classical diffusional mass transfer process without involving heat, among the following.
- (A) Drying of food grains
 - (B) Carbonation of beverages
 - (C) Distillation of alcohol
 - (D) Concentration of fruit juice
- Q.18 For an enzyme catalyzed reaction $S \rightarrow P$, the kinetic parameters are:
 $[S] = 40 \mu\text{M}$, $V_0 = 9.6 \mu\text{M s}^{-1}$ and $V_{\max} = 12.0 \mu\text{M s}^{-1}$.
The K_m of the enzyme in μM will be _____.(up to one decimal points)
- Q.19 A microbial sample taken at 10 AM contained 1×10^5 CFU/mL. The count reached to 1×10^{10} CFU/mL at 8 PM of the same day. The growth rate (h^{-1}) of the microorganism would be _____.(up to two decimal points)
- Q.20 The rate of heat transfer per unit area from a metal plate is 1000 W m^{-2} . The surface temperature of the plate is 120°C and ambient temperature is 20°C . The convective heat transfer coefficient ($\text{W m}^{-2} ^\circ\text{C}^{-1}$) using the Newton's law of cooling will be _____.

END OF THE QUESTION PAPER

Q.No.	Type	Section	Key/Range	Marks
1	MCQ	GA	A	1
2	MCQ	GA	C	1
3	MCQ	GA	B	1
4	MCQ	GA	B	1
5	MCQ	GA	B	1
6	MCQ	GA	A	2
7	MCQ	GA	D	2
8	MCQ	GA	D	2
9	MCQ	GA	B	2
10	MCQ	GA	C	2
1	MCQ	XL-P	A	1
2	MCQ	XL-P	D	1
3	MCQ	XL-P	D	1
4	NAT	XL-P	11 to 11	1
5	NAT	XL-P	4 to 4	1
6	MCQ	XL-P	D	2
7	MCQ	XL-P	D	2
8	MCQ	XL-P	A	2
9	MCQ	XL-P	D	2
10	MCQ	XL-P	A	2
11	MCQ	XL-P	C	2
12	MCQ	XL-P	B	2
13	NAT	XL-P	1.39 to 1.43	2

Q.No.	Type	Section	Key/Range	Marks
14	NAT	XL-P	7.39 to 7.54	2
15	NAT	XL-P	-13.40 to -13.36	2
1	MCQ	XL-Q	B	1
2	MCQ	XL-Q	A	1
3	MCQ	XL-Q	C	1
4	MCQ	XL-Q	C	1
5	MCQ	XL-Q	D	1
6	MCQ	XL-Q	C	1
7	MCQ	XL-Q	D	1
8	MCQ	XL-Q	B	1
9	NAT	XL-Q	12 to 12	1
10	NAT	XL-Q	50 to 50	1
11	MCQ	XL-Q	A	2
12	MCQ	XL-Q	A	2
13	MCQ	XL-Q	D	2
14	MCQ	XL-Q	B	2
15	MCQ	XL-Q	B	2
16	NAT	XL-Q	512 to 512	2
17	NAT	XL-Q	20 to 20	2
18	NAT	XL-Q	0.8 to 0.8	2
19	NAT	XL-Q	77 to 77	2
20	NAT	XL-Q	-8862 to -8862	2
1	MCQ	XL-R	A	1

Q.No.	Type	Section	Key/Range	Marks
2	MCQ	XL-R	B	1
3	MCQ	XL-R	C	1
4	MCQ	XL-R	D	1
5	MCQ	XL-R	B	1
6	MCQ	XL-R	C	1
7	MCQ	XL-R	A	1
8	MCQ	XL-R	A	1
9	MCQ	XL-R	B	1
10	NAT	XL-R	28.00 to 31.00	1
11	MCQ	XL-R	D	2
12	MCQ	XL-R	D	2
13	MCQ	XL-R	C	2
14	MCQ	XL-R	B	2
15	MCQ	XL-R	C	2
16	MCQ	XL-R	D	2
17	MCQ	XL-R	A	2
18	MCQ	XL-R	B	2
19	NAT	XL-R	20.25 to 20.25	2
20	NAT	XL-R	11.00 to 12.00	2
1	MCQ	XL-S	B	1
2	MCQ	XL-S	A	1
3	MCQ	XL-S	A	1
4	MCQ	XL-S	D	1

Q.No.	Type	Section	Key/Range	Marks
5	MCQ	XL-S	D	1
6	MCQ	XL-S	C	1
7	MCQ	XL-S	D	1
8	MCQ	XL-S	B	1
9	MCQ	XL-S	A	1
10	NAT	XL-S	1.38 to1.42	1
11	MCQ	XL-S	C	2
12	MCQ	XL-S	C	2
13	MCQ	XL-S	A	2
14	MCQ	XL-S	D	2
15	MCQ	XL-S	B	2
16	MCQ	XL-S	A	2
17	NAT	XL-S	2.60 to 2.80	2
18	NAT	XL-S	0.5 to 0.5	2
19	NAT	XL-S	45.50 to 46.50	2
20	NAT	XL-S	30.5 to 31.5	2
1	MCQ	XL-T	C	1
2	MCQ	XL-T	B	1
3	MCQ	XL-T	A	1
4	MCQ	XL-T	D	1
5	MCQ	XL-T	C	1
6	MCQ	XL-T	D	1
7	MCQ	XL-T	B	1

Q.No.	Type	Section	Key/Range	Marks
8	MCQ	XL-T	A	1
9	MCQ	XL-T	A	1
10	MCQ	XL-T	C	1
11	MCQ	XL-T	B	2
12	MCQ	XL-T	D	2
13	MCQ	XL-T	C	2
14	MCQ	XL-T	C	2
15	MCQ	XL-T	B	2
16	MCQ	XL-T	D	2
17	MCQ	XL-T	C	2
18	MCQ	XL-T	A	2
19	NAT	XL-T	5270 to 5310	2
20	NAT	XL-T	0.056 to 0.062	2
1	MCQ	XL-U	B	1
2	MCQ	XL-U	A	1
3	MCQ	XL-U	C	1
4	MCQ	XL-U	A	1
5	MCQ	XL-U	D	1
6	MCQ	XL-U	D	1
7	NAT	XL-U	1.55 to 1.65	1
8	NAT	XL-U	103.0 to 103.2	1
9	NAT	XL-U	54 to 56	1
10	NAT	XL-U	0 to 0	1

Q.No.	Type	Section	Key/Range	Marks
11	MCQ	XL-U	B	2
12	MCQ	XL-U	C	2
13	MCQ	XL-U	C	2
14	MCQ	XL-U	A	2
15	MCQ	XL-U	D	2
16	MCQ	XL-U	A	2
17	MCQ	XL-U	B	2
18	NAT	XL-U	9.8 to 10.2	2
19	NAT	XL-U	1.1 to 1.8	2
20	NAT	XL-U	10 to 10	2