

Note:

1. All the questions are compulsory. Choice is internal.
2. Figures to the right indicate full marks.
3. All questions carry equal marks.
4. Draw flowcharts/diagrams wherever necessary.

Q.1.A) State True or false:**(04)**

1. Live probiotic cultures are available in fermented dairy products and probiotic fortified foods.
2. *C. botulinum* is responsible for foodborne botulism, infant botulism and wound botulism.
3. *Staphylococcus aureus* is an air borne microorganism.
4. Viruses have a protein capsid which is square in structure.

Q.1.B) Answer of the following: (Any three)**(09)**

1. Write short note on Kimchi
2. Write short note on Candidiasis
3. Write short note on Cholera
4. Write short note on Hepatitis B
5. Write short note on Food borne
6. Write short note on Normal flora

Q.1.C) Answer of the following: (Any two)**(12)**

1. Write a note on Tuberculosis and its causative agent.
2. Explain any two water borne organisms in detail.
3. Write a short note on *Clostridium tetani*.
4. Write a short note on probiotics.

Q.2.A) State True or False:**(04)**

1. Hanging drop is a method used in protoplast culture.
2. Enzymes like collagenase are used for disaggregation of animal tissue.
3. Ross Harrison first developed a frog tissue culture technique in 1992.
4. The culture before first subculture is called as cell line.

Q.2.B) Answer the following: (Any three)**(09)**

1. Write short note on Finite cell lines
2. Write short note on Dedifferentiation
3. Write short note on Embryonic stem cells
4. Write short note on Blastocyst
5. Write short note on Plexiglass
6. Write short note on Secondary metabolites

Q.2.C) Answer the following: (Any two)**(12)**

1. Write in brief about applications of plant tissue culture.
2. With the help of diagram explain what is hybridoma.
3. Describe in detail about protoplast culture.
4. Explain different techniques used for primary culture.

Q.3.A) State True or False:**(04)**

1. Industrial biotechnology is also known as Green technology.
2. Enzymes are inactivated by the heat generated in the system.
3. A process by which molecules such as glucose are broken down aerobically is called as Fermentation.
4. Large scale industrial fermenters are always constructed of Stainless steel.

Q.3.B) Answer the following: (Any three)**(09)**

1. What is a Fermenter and explain the process of fermentation?
2. Explain the process of Wine production.
3. Explain stabilisation of soluble enzymes.
4. Write a short note on Continuous Stirred tank bioreactor.
5. Write a short note on Micro-encapsulation.
6. Write a short note on Biosensors.

Q.3.C) Answer the following: (Any two)**(12)**

1. Describe in brief the Construction of a typical fermenter.
2. Explain the process of antibiotic production.
3. Explain in brief the process of Immobilisation of enzymes.
What are Air lift Bioreactor?

Q.4.A) Define and explain: (Any five)**(10)**

1. Biofertilizers
2. Bacteriophage
3. Viral envelope
4. CO₂ incubator
5. Stem cells
6. Covalent Bonding
7. Fermenter

Q.4.B) Write Short notes on: (Any three)**(15)**

1. Food borne microorganism
2. *Corynebacterium diphtheriae*
3. Callus culture
4. Whole embryo culture
5. Parts of biosensors
6. Single cell Proteins