

N.B. : All questions are compulsory

All questions carry equal marks

Draw neat and labeled diagrams wherever necessary

- 1 (a) State the starter culture associated with **(any four)** 4
- (I) Cheddar cheese (ii) Red wine
 (iii) Lysine (iv) Cultured butter milk
 (v) Beer spoilage (vi) Ethanol
- (b) State the role of **(any two)** 4
- (i) Racking in wine production
 (ii) Rennet in cheese manufacture
 (iii) Beechwood in production of vinegar
- (c) Attempt the following **(any two)** 12
- (i) Discuss the role of dairy starter culture in manufacture of dairy products with suitable examples
 (ii) State the production and recovery process for Penicillin
 (iii) Elaborate on the normal flora of milk and state the significance of coliforms in it
- 2 (a) State the function of **(any four)** 8
- (i) Silicone compounds
 (ii) Inlet gas analyser
 (iii) Sampling port
 (iv) Safety valves
 (v) Filtration in product recovery
 (vi) Injector
- (b) Discuss the following **(any two)** 12
- (i) The construction, working and application of airlift fermentor
 (ii) The various stages in the development of bacterial processes in inoculum development
 (iii) The use of centrifugation as an important step in product purification
- 3 (a) Explain the terms **(any four)** 8
- (i) QC
 (ii) Biocontrol agent
 (iii) Soft callus
 (iv) SOP
 (v) Artificial seed
 (vi) Biofertiliser

(b) Attempt the following **(any two)** 12

- (i) Concept of ISO certification and standard
- (ii) Areas of commercialisation in Biotechnology
- (iii) Meristem culture for virus elimination

4 (a) Give the significance of **(any four)** 8

- (i) Pollution control boards
- (ii) Phyto remediation
- (iii) TSS
- (iv) Biogas
- (v) BOD
- (vi) Air act

(b) Elaborate the following **(any two)** 12

- (i) Nature of waste from a dairy and discuss its treatment measures
- (ii) Any one process of biological production of hydrogen gas and its applications
- (iii) Use of petrocrops as a source of energy

5. Write short notes on **(any four)** 20

- (i) Scale down methods
- (ii) Plant cell permeabilisation
- (iii) Malolactic fermentation
- (iv) Renewable energy sources
- (v) Advantages and disadvantages of biofertilizers
- (vi) Microbial bioremediation