

- NB : 1) **All Questions are Compulsory.**
 2) **All questions carry equal marks.**
 3) **Draw labelled diagrams wherever necessary.**

1. (A) Do as directed (**Any Three**) 03
 - (i) Name a fermentor used for production of vinegar.
 - (ii) What do you mean by height to diameter ratio ?
 - (ii) Explain the term "in line sensor"
 - (iv) Define perfusion cultures
 - (v) Fill in the blank -
 _____ are semiconductors made from specific mixtures of pure oxides of iron , nickel and other metals.
 - (vi) Name any one gauge used to measure pressure.
- (B) Attempt the following (**Any Two**) 12
 - (i) State any two devices used to measure pressure in a fermentation process.
 - (ii) How can you measure and control inlet and exit gas ?
 - (iii) Explain structure and working of an outer loop airlift fermentor.
 - (iv) Elaborate on the construction principle and working of a deep jet fermentor.
2. (A) Explain the following terms (**Any Three**) 03
 - (i) Primary Screening
 - (ii) Seed culture
 - (iii) Brewing
 - (iv) Diffusion assay
 - (v) Scale-down
 - (vi) Inoculum development
- (B) Answer the following (**Any Two**) 12
 - (i) Elaborate on secondary screening
 - (ii) Explain inoculum development programme for the vitamin B₁₂ producer *Pseudomonas*.
 - (iii) Discuss major factors involved in scale-up.
 - (iv) Give an account of the methods used for screening of antibiotic producers from soil.

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3. (A) Give significance of / importance of **(Any Three)** **03**
- (i) Mashing
 - (ii) Malolactic fermentation
 - (iii) Beechwood shavings
 - (iv) Corn steep liquor
 - (v) Hops
 - (vi) Spawn
- (B) Discuss the following **(Any Two)** **12**
- (i) Red wine fermentation protocol.
 - (ii) The production of Vinegar schematically.
 - (iii) The fermentation and recovery of Citric acid.
 - (iv) The production of Penicillin G.
4. (A) State the role / function of the following in product recovery **(Any Three)** **03**
- (i) Crystallization
 - (ii) Filter aids
 - (iii) Solvent extraction
 - (iv) Flocculating agents
 - (v) Ultrafiltration
 - (vi) Collectors
- (B) Give an account of the following with respect to downstream processing **(Any Two)** **12**
- (i) Two types of centrifugation techniques
 - (ii) Drying
 - (iii) Rotary vacuum filters
 - (iv) Any two chemical cell disruption methods
5. Write short notes on following **(Any Three)** **15**
- (i) Working of a tower fermentor
 - (ii) Measurement of biomass
 - (iii) Criteria for the transfer of inoculum
 - (iv) Spoilage in Beer
 - (v) Chromatography in product recovery
 - (vi) Foam separation in downstream processing
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