

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2024****Subject Code:3161408****Date:20-05-2024****Subject Name:Food Fermentation Technology****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1**
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|-----|--|-----------|
| (a) | Give health benefits of wine consumption | 03 |
| (b) | Give mathematical derivation for K_{La} value | 04 |
| (c) | Explain using a well-illustrated flowchart the steps of beer production. How the green colored beer transforms into golden yellow color? What is the significance of hops flowers in beer composition? | 07 |
- Q.2**
- | | | |
|-----|---|-----------|
| (a) | Suggest the consequences in case of failure of containment in fermentation industry | 03 |
| (b) | Write a note on 'scale up of batch sterilization process' | 04 |
| (c) | Enlist various methods of protein purification | 07 |
- OR**
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|-----|---|-----------|
| (c) | Write in brief about important chemical components of grapes responsible for wine quality | 07 |
|-----|---|-----------|
- Q.3**
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|-----|---|-----------|
| (a) | Explain the concept of 'Design organism' during sterilization. Name the most commonly used design organism with its thermal death characteristics. | 03 |
| (b) | What is importance of separation and pressing during wine making | 04 |
| (c) | Explain the genetic regulation of Lac operon in terms of ATP in cell, cAMP level in cell, CAP-cAMP moiety's presence on promoter site, RNA polymerase on promoter, repressor on operator site, operon on or off; when a) only glucose is present, b) only lactose is present, c) both sugars present, d) both sugars absent | 07 |
- OR**
- Q.3**
- | | | |
|-----|--|-----------|
| (a) | Give health benefits of wine consumption | 03 |
| (b) | Describe types of spargers, impellers, valves used in fermenter | 04 |
| (c) | Describe the concept of adsorption chromatography using an illustration. What are the disadvantages of adsorption chromatography? How does it differ from affinity elution chromatography? | 07 |
- Q.4**
- | | | |
|-----|--|-----------|
| (a) | Write a short note on 1) turbidostat and 2) chemostat | 03 |
| (b) | Write in brief about crushing and maceration processes during wine manufacture | 04 |
| (c) | Write detailed note on oxygen requirement of industrial fermentation process | 07 |

OR

- Q.4** (a) Give the flow diagram for manufacture of beer **03**
(b) Write a note on “Calculation of holding time at constant temperature” during sterilization. **04**
(c) Give flow diagram for wine manufacture and describe fermentation process in wine. **07**
- Q.5** (a) Define specific oxygen uptake rate and give effect of dissolved oxygen concentration on it. **03**
(b) Draw a flowchart to depict production of tempeh, an oriental fermented food **04**
(c) Write in brief about important chemical components of grapes responsible for wine quality **07**
- OR**
- Q.5** (a) Write a short note on types of spirits **03**
(b) Explain Richards rapid method for calculation of del factor **04**
(c) What is fermentation, its advantages, and disadvantages. Draw a well illustrated diagram of a fermenter and enlist all parts of fermenter and their function. **07**
