

Instructions: All questions in Section I carry equal marks
 Attempt any THREE questions in Section I
 Question IX in Section II is compulsory

Section I (42 marks)

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| Q I | (a) Discuss the steps involved in fermentative production of Beer. | 7 |
| | (b) Describe the submerged fermentation process for citric acid production. | 7 |
| Q II | (a) Discuss the production and recovery of acetic acid. | 7 |
| | (b) Discuss production of ethanol from lignocellulosic biomass. | 7 |
| Q III | (a) Discuss synthesis and economic importance of Riboflavin | 7 |
| | (b) Write detailed note on production of Alpha amylases | 7 |
| Q IV | (a) Discuss application of proteolytic enzymes in various industries with specific examples | 7 |
| | (b) Discuss production of L Glutamic Acid. | 7 |
| Q V | (a) Write detailed note on production of ergot alkaloids | 7 |
| | (b) Discuss the new B lactam technology for production of 7- aminocephalosporanic acid.(7-ACA). | 7 |
| Q VI | (a) Name different types of vaccines and their mode of action with examples | 7 |
| | (b) Write a note on Siderophores and their mode of action. | 7 |
| Q VII | (a) Discuss in detail the fermentative production aspects of xanthan | 7 |
| | (b) Discuss various approaches used for microbial transformation of steroids with suitable illustrations. | 7 |
| Q VIII | (a) Enlist types of biosurfactants produced by microbes. Write role of biosurfactant and discuss major steps for its production. | 7 |
| | (b) Discuss in detail the factors influencing the microbial production of EPS. | 7 |

Section II (8 marks)

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| Q IX | Short Questions (One mark each) | |
| | 1. What are Distillers Grain | 1 |
| | 2. What is viticulture | 1 |
| | 3. Give few examples of food sources rich in L-lysine | 1 |
| | 4. What is takadiastase? | 1 |
| | 5. Two examples of anticancer agents | 1 |
| | 6. Two producers of streptomycin | 1 |
| | 7. What is 'biopol'? | 1 |
| | 8. What is PHBV polymer? | 1 |