

D.K.M.COLLEGE FOR WOMEN (AUTONOMOUS), VELLORE-1.

BIOPROCESS TECHNOLOGY

SECTION-A

6 MARKS

1. Explain the bioprocess engineering.
2. Discuss about the bioprocess technology
3. What are the general principles of bioreactor?
4. Describe the design of bioreactor
5. What are the basic functions of bioreactor?
6. What are the types of bioreactors?
7. Explain about the continuous stirred tank bioreactor
8. Describe about the bubble column bioreactors
9. Discuss about the airlift bioreactor
10. Explain about the fluidized bed bioreactor
11. Discuss about the packed bed bioreactor
12. Describe the photo bioreactors
13. Explain the fermentation media
14. What are the types of fermentation media?
15. Explain about the sterilization of media
16. Discuss about the sterilization methods
17. What are the major sources of media?
18. Explain about microbial growth and culture system
19. Explain about the analysis of batch culture methods
20. Describe about the fed-batch culture methods
21. Discuss about the continuous fermentation
22. What is downstream processing?
23. What are the stages of DSP?
24. Explain the solid-liquid separation methods
25. Discuss about the media purification methods
26. Explain about the media formulations
27. Explain about media substrate used as carbon, nitrogen and growth factor
28. Explain the isolation, selection and screening of microorganisms

29. Explain the strain improvement
30. Explain in detail about screening of microorganisms
31. Explain in detailed about fed batch and continuous fermentation methods
32. Discuss about the genetic improvement of strains
33. What are the methods of strain development?
34. Define – mutation
35. Define- genetic recombination
36. Explain about the microbial productions
37. Discuss about the microbial productions of organic solvent ethanol productions
38. Explain about the microbial productions of citric acid
39. Discuss about the microbial productions of acetic acid
40. Explain the gluconic acid productions.
41. Discuss about the microbial productions of penicillin
42. Discuss about the microbial productions of tetracyclin
43. Discuss about the microbial productions of L-glutamic acid
44. Discuss about the microbial productions of vitamin B₁₂
45. Discuss about the strategies of strain improvement for primary metabolites with relevant example s
46. Discuss about the strategies of strain improvement for secondary metabolites with relevant examples
47. Explain the microbial productions of cheese
48. Write short note on microbial productions of yoghurt
49. Explain the microbial productions of bread
50. Define – wine preparations
51. Explain the beer productions
52. Discuss about the spirulina productions
53. Discuss about the mushroom cultivation
54. Explain about the roles of microbes in mining and oil recovery process
55. Explain the biofuel productions.

SECTION-B 10 MARK

1. Explain in detailed about the fermentation media and its type
2. Discuss detailed about the general principles of bioreactor
3. e Explain in detailed about the design of bioreactor
4. Explain in detailed about the functions of conventional bioreactor
5. Explain in detailed about the types of bioreactor
6. What are the differences between the continuous stirred tank bioreactor
7. Explain in detailed about the bioprocess engineering
8. Explain in detailed about the fermentation media
9. Explain in detailed about the photo bioreactor
10. Explain in detailed about the basic functions of a conventional bioreactor
11. Explain in detailed about the general applications of bioreactor
12. Explain in detailed about the differences between the bubble column and airlift bioreactors
13. Explain in detailed about the applications of fluidized bed bioreactor
14. Explain in detailed about the scope of packed bed bioreactors
15. Explain in detailed about the differences between the packed bed and photobioreactors.
16. Explain in detailed about the sterilization of media and gas
17. Explain in detail about the industrial products of fermentation technology
18. Explain in detailed about the two –stage air lift bioreactors
19. Discuss about the operation of a conventional bioreactor
20. Discuss about the in situ sterilization methods
21. Explain in detail about the industrial products of solid state fermentations.
22. What are the advantages of SSF
23. What are the substrates used as carbon sources?
24. What are the substrates used as nitrogen sources?
25. What are the substrates used as sources of growth factors.
26. Explain the heat sterilization methods
27. Explain the physical sterilization methods
28. Discuss about the batch sterilization methods
29. Discuss about the continuous sterilization methods
30. Explain in detail about the sterilization of air

31. Discuss about the enrichment methods for isolation of microorganisms
32. Write a note on screening of metabolites for isolation of microorganisms
33. Discuss about the overproduction of primary metabolites
34. Explain in detail about the secondary metabolites
35. What are the characteristics of secondary metabolites?
36. What are the functions of secondary metabolites?
37. Explain in detail about the over production of secondary metabolites
38. Explain the basic principles of microbial growth and culture systems
39. Write note on batch culture fermentations
40. What are the advantages and disadvantages of continuous fermentations
41. Explain the growth kinetics of microorganisms
42. What are the classifications of fermentation process
43. Explain the inoculums maintenance methods.
44. Explain the detail about the measurement and control of bioprocess parameters.
45. What are the major types of filtration processes with characteristic features?
46. What are the releases of intracellular products?
47. Explain the liquid –liquid extraction methods.
48. Explain in detail about the membrane filtration methods.
49. Explain the production of ethanol by fermentation processes.
50. Explain the biosynthesis of ethanol.
51. Explain the production process of ethanol.
52. Discuss about the microbial production of organic acids.
53. What are the applications of citric acid?
54. Explain the microbial strains for citric acid production.
55. Explain the detail about the microbial biosynthesis of citric acid.
56. Discuss about the enzymatic regulations of citric acid production.
57. What are the factors in regulation of citric acid productions?
58. Explain the citric acid production surface processes.
59. Explain the detail about the liquid surface citric acid fermentations.
60. Explain the detail about the submerged processes of citric acid fermentations.
61. Discuss about the production of citric acid from alkanes.
62. Explain in detail about the recovery of citric acid.

63. What are the applications of gluconic acid?
64. Explain the detail about microbial production of gluconic acid.
65. Discuss about the production process for gluconic acid.
66. What are the major applications of lactic acid?
67. Explain the microorganisms for production of lactic acid.
68. Explain in detail about the production process for lactic acid.
69. What are the applications of acetic acid?
70. What are the microorganisms used for production of acetic acid?
71. Explain about the production process for acetic acid.
72. Write note on production of vinegar.
73. Explain in detail about the microbial production of antibiotics.
74. Write note on actions of penicillin.
75. What are the organisms involved for penicillin production?
76. Discuss about the biosynthesis of penicillin.
77. Explain the production process of penicillin.
78. Discuss about the recovery of penicillin.
79. What are the organisms for tetracycline production?
80. Explain about the biosynthesis of tetracyclines.
81. Discuss about the different processes of tetracycline production.
82. What are the commercial applications of microbial productions of amino acids?
83. Explain the strain development for amino acid production.
84. Discuss about the microbial productions of L-glutamic acid.
85. What are the regulations of glutamic acid biosynthesis?
86. Explain the glutamic acid production and recovery methods.
87. Discuss about the microbial production of vitamins.
88. Write note on microorganisms and yields of vitamin B₁₂
89. Explain the production of vitamin B₁₂ using *Pseudomonas* sp.
90. Discuss about the microbial production of foods and beverages.
91. What are the advantages of fermented foods?
92. Explain the cheese production process and sources of chymosin for cheese productions
93. Discuss about the yoghurt productions.
94. Explain the bread productions

95. What are the general aspects of alcoholic beverage productions?
96. Explain the beer productions- malting, mashing, fermentation and maturation methods
97. Explain the types of wines and production processes
98. What are the advantages of using microorganisms for SCP productions?
99. Explain the safety, acceptability and toxicity of SCP
100. What are the microorganisms and substrates used for production of SCP?
101. Explain the production of SCP from high energy sources
102. Explain the production of SCP from wastes
103. Production of SCP from wood, CO₂ and sewage.
104. What are the advantages of edible mushroom biotechnology?
105. Explain the microbes in mining, oil recovery and biofuel production.
