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Question Paper Code: 94D04

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

Fourth Semester

Biotechnology

19UBT404- Enzyme Engineering and Technology

(Regulations 2019)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

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| 1. Describe schematically different sites of substrate binded to enzymes | CO1- U |
| 2. Explain stereo chemical specificity of an enzyme with an example. | CO1- U |
| 3. Define Turnover number. | CO1- U |
| 4. Explain pseudo first order reaction with an example. | CO1- U |
| 5. Write the characteristics of immobilized enzyme | CO1- U |
| 6. Illustrate various methods of Enzyme immobilization | CO1- U |
| 7. Differentiate Affinity and Ion exchange chromatography | CO1- U |
| 8. Write the significance of isoelectric point | CO1- U |
| 9. What is a biosensor? | CO1- U |
| 10. Illustrate an electrochemical cell and mention its parts. | CO1- U |

PART – C (5 x 16= 80 Marks)

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|---|----------|------|
| 11. (a) Explain in detail how enzymes were classified based on their biochemical reaction with examples for each. | CO1- U | (16) |
| Or | | |
| (b) Explain in detail the types of specificity and the concept of active site. | CO1- U | (16) |
| 12. (a) Derive a kinetic equation which relates the velocity and substrate concentration of a single substrate reaction and explain in detail the various graphical representation of the relationship. | CO2- App | (16) |

Or

- (b) Illustrate how enzymatic reaction is regulated and explain the model in detail. CO2- App (16)

13. (a) Classify the carrier molecules used for enzyme immobilization and explain in detail the various ways carriers were used for immobilization process. CO1- U (16)

Or

- (b) Explain in detail about the properties of immobilized enzyme and the physical and chemical methods for enzyme immobilization. CO1- U (16)

14. (a) Suggest a chromatography technique to purify a partially purified enzyme molecule using salting out technique. Justify your answer in detail CO2- App (16)

Or

- (b) An enzyme was produced by eukaryotic cell intracellular. The cells were lysed and the molecules filtered. Now suggest a chromatography technique to separate the enzyme from rest filtrate and justify it by explaining it in detail. CO2- App (16)

- 15 (a) In a hospital for doing a routine checkup for the In-patient, the management has gave us an project to design a biosensor for detecting glucose level. Suggest me an idea and design to develop it and justify it in detail. CO2- App (16)

Or

- (b) I have planned to start an analytical laboratory for testing various biological samples. Suggest me some ideas and design for developing biosensors and explain the principle behind them in detail. CO2- App (16)