Reg. No: ☐☐☐☐☐☐

PH 501.2

St Aloysius College (Autonomous)
Mangaluru
Semester II– P.G. Examination – M.Sc. Biotechnology
July – 2022

GENETIC ENGINEERING

Time: 3 Hours   Max. Marks: 70

Note: Draw neat labeled diagrams/schematic sketches/structures wherever necessary

I. Write short notes on any FIVE of the following.   (5x3 = 15)

1. Isoschizomers
2. DNA Ligases
3. BAC
4. M13 vector
5. Gene probes
6. Southern blotting
7. Primer design
8. Ribosome Profiling

II. Write explanatory notes on any FIVE of the following.
(5x5=25)

9. Discuss principle and applications of TA cloning.
10. Give an account on Isolation of mRNA.
11. What is His-tag? Discuss the mechanism and application in protein purification.
12. With neat labeled diagram, describe the structure and application of pBR322.
13. What are liposomes? Discuss the role and methods involved in liposome mediated gene transfer.
14. Define and discuss about Colony hybridization
15. Nested PCR
16. Write short note on MinION nanopore

III Answer any THREE of the following.   (3×10=30)

17. Give a detailed account on the construction & applications of cDNA libraries.
18. With a suitable example, describe the characteristics of Expression vectors.
19. Write a note on various selectable markers.
20. Define real time PCR. Elaborate on its usefulness in Medical diagnostics.
21. With respect to Transcriptomic Analysis, discuss the following: i) RNA- Seq, ii) Long Noncoding RNAs.

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Semester II – P.G. Examination - M.Sc. Biotechnology

July – 2022

ENZYMOLOGY

Time: 3 hrs   Marks: 70

NOTE: Draw neat labelled diagrams/schematic sketches/structures wherever necessary

I.   Write short notes on any FIVE of the following.   (5×3=15)

1.   Review the effect of pH on enzyme activity citing examples.

2.   Write a note on proximity and orientation reaction of enzymes.

3. K_m is a good parameter for judging in vivo substrate concentrations. Justify.

4.   Write the Cleland notation of random sequential mechanism with an example.

5.   Draw the schematic representation of Chymotrypsin activation.

6.   Write a note on Lineweaver-Burk Plot

7.   Give a short note on TPP as a co-enzyme.

8.   What are transaminases?

II.   Write explanatory notes on any FIVE of the following.   (5×5=25)

9.   Discuss the purification of enzymes.

10. Mechanism of RNase is said to be acid-base catalysis. Why?

11. Differentiate between the two models of ATCase.

12. Explain the uninhibited and inhibited graphs of uncompetitive and non-competitive inhibitions.

13. Discuss on Eddie-Hofstee and Hanes Plot.

14. Explain Ping Pong mechanism with Cleland notation and example.

15. Give the clinical significance of AST and ALT.

16. Through an example, explain how enzyme biosensors are fabricated.

III. Answer any THREE of the following.   (3×10= 30)

17. Define enzyme. Explain the nomenclature of IUBMB classification of enzymes.

18. Derive Michaelis-Menten equation.

19. Explain the kinetics of Competitive inhibition.

20. Give a detailed account on Blood clotting cascade mechanism.

21. Give an account on isoenzymes and their significance.

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St. Aloysius College (Autonomous)
Mangaluru
Semester II – P.G. Examination - M.Sc. Biotechnology
July – 2022
RESEARCH METHODOLOGY, ETHICS AND SCIENTIFIC COMMUNICATION

Time: 3 Hours   Max. Marks: 70

Note: Draw neat labeled diagrams/schematic sketches/structures wherever necessary

I. Write short notes on any FIVE of the following.   (5x3=15)

1. Plagiarism
2. Mendeley Software
3. Guest authorship
4. h-index
5. Techniques involved in defining problem
6. Secondary data
7. Lab note book
8. Hypothesis

II. Write explanatory notes on any FIVE of the following.   (5x5= 25)

9. Preparation for research and choosing a mentor
10. Purpose driven research
11. Discuss different software used for detecting plagiarism
12. What is Altmetric?
13. Non-experimental design of research
14. Qualitative methods of data collection
15. Copy right form
16. Features of predatory journals

III. Answer any THREE of the following.   (3×10=30)

17. Give an account of different types of research misconduct.
18. Explain probability sampling techniques.
19. Explain the different elements of scientific research paper.
20. Give an account of method based research.
21. Explain the essential features in writing a grant proposal.

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St. Aloysius College (Autonomous)
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Semester II – P.G. Examination - M.Sc. Biotechnology
July – 2022
ANALYTICAL TECHNIQUES IN BIOTECHNOLOGY

Time: 3 Hours   Max. Marks: 70

Note: Draw neat labeled diagrams/schematic sketches/structures wherever necessary

I. Write short notes on any <u>FIVE</u> of the following.   (5x3=15)

1. Beer - Lambert's law.
2. Isoelectric focusing
3. Units of radioactivity and Radioactive decay
4. Resolving power
5. Factors affecting electrophoresis
6. Paper chromatography
7. Bragg's law
8. Isotope dilution technique

II. Write explanatory notes on any <u>FIVE</u> of the following.   (5x5=25)

9. Clinical applications of radioisotopes
10. Transmission electron microscope
11. Autoradiography
12. Isopycnic centrifugation
13. Pulsed field gel electrophoresis
14. HPTLC
15. NMR
16. Ion exchange chromatography

III. Answer any <u>THREE</u> of the following.   (3×10=30)

17. Write in detail about the principle, instrumentation and applications of UV-Vis spectroscopy
18. Give a detailed account on Gas Chromatography. Add a note on its applications
19. Discuss the deferential and density gradient centrifugation. Add a note on the factors affecting centrifugation
20. Discuss the various techniques of measurement of radioactivity.
21. Explain in detail about confocal and fluorescence microscopes

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