PH 511.2   Reg. No. :

St Aloysius College (Autonomous)

Mangaluru

Semester II – P.G Examination – M.Sc. Biochemistry

May/June - 2023

ENZYMOLOGY

Time: 3 Hours   **Max. Marks: 70**

I. Answer any TEN sub-divisions of the following: **(10x2=20)**

1. Distinguish between specificity and specific activity of an enzyme.
2. How are metalloenzymes different from metal-activated enzymes?
3. What is coupled enzyme assay? Give an example.
4. What is endpoint assay? Mention its significance.
5. Differentiate the order and molecularity of an enzyme.
6. What is the stopped-flow method? Give its significance.
7. What is suicide inhibition? Give an example.
8. Define transition state theory with an example.
9. What is the proximity and orientation effect?
10. What is zymogen activation? Give an example.
11. What are abzymes? Mention their significance.
12. What is the Hill-Scatchard plot? Mention its importance.

II. Answer any SIX of the following: **(6x5=30)**

13. Give an account on isoenzymes.
14. Discuss the symmetric (MWC) & sequential models (KNF) for the action of allosteric enzymes.
15. Write the coenzymic action of TPP and Coenzyme A.
16. Explain the mechanism of action of ribonuclease A.
17. Write an account on affinity labeling and chemical modification studies.
18. Discuss the ping pong and ordered bi-bi reactions.
19. Give an account on purification of enzymes. List the criteria of purity of enzymes.
20. How are enzymes classified by IUB?

III. Answer any TWO of the following: **(2x10=20)**

21. Derive the Michaelis-Menten equation based on the steady-state approach. Add a note on the linearization of the Michaelis-Menten equation.
22. Explain the mechanism of action of chymotrypsin. Add a note on the mechanism of action of ribozymes.
23. Describe in detail the competitive and noncompetitive inhibitions.
24. Elaborate on the enzyme immobilization methods and their applications.

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METABOLISM

Time: 3 Hours   Max. Marks: 70

I.   Answer any <u>TEN</u> sub-divisions of the following: (10x2=20)

1. What is amphibolic pathway? Give example.

2. What is glyoxylate pathway? What is its significance?

3. Give the schematic representation of Glycerol phosphate shuttle.

4. What is Q cycle?

5. What is P/O ratio?

6. What are cytochromes? What is its role in ETC?

7. What are prostaglandins? Mention their significance.

8. What are chylomicrons? How are they formed?

9. What are ketone bodies?

10. List any two disorders of lipid metabolism. State their symptoms.

11. What is GTT? What is its significance?

12. What are the different types of lipoprotein modifications?

II. Answer any <u>SIX</u> of the following: (6x5=30)

13. Explain the Krebs cycle.

14. Discuss the hormonal regulation of glycogenesis and glycogenolysis.

15. Discuss the regulation of cholesterol synthesis.

16. Discuss β-oxidation of fatty acids.

17. Discuss the diagnostic tests for lipid disorders.

18. Discuss uncouplers and inhibitors of oxidative phosphorylation.

19. Write a note on Diabetes mellitus.

20. Explain binding change mechanism of ATP synthesis.

III. Answer any <u>TWO</u> of the following: (2x10=20)

21. Discuss in detail the denovo pathways of fatty acid synthesis.

22. Discuss in detail the inborn errors of carbohydrate metabolism.

23. Discuss oxidative phosphorylation.

24. Explain glycolysis with structures. Add a note on its energetics.

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PS 514.2   Reg. No. :

St Aloysius College (Autonomous)
Mangaluru

Semester II – P.G Examination – M.Sc. Biochemistry
May/June – 2023

RESEARCH METHODOLOGY AND ETHICS

Time: 3 Hours   Max. Marks: 70

I. Answer any TEN sub-divisions of the following: (10x2=20)

1. List the types of research designs.

2. What is snowball sampling?

3. Differentiate between primary and secondary data.

4. List four citation tools/software.

5. What is the difference between nominal scale and ordinal scale?

6. What is meant by 95% percentile?

7. Define kurtosis. How is it measured?

8. What is conditional probability? How can it be determined?

9. What is the formula to calculate standard error when population mean is unknown?

10. How can a scatter plot be used to show the relationship between two variables?

11. What is self-plagiarism?

12. What are the regulations in patenting of genes?

II. Answer any SIX of the following: (6x5=30)

13. Outline the stages in a research process.

14. Discuss the layout of a scientific report.

15. Describe various graphical representations of data.

16. Compare and contrast binomial and Poisson distribution.

17. Determine if the distribution of students by geo-regionality differed in the two groups using χ^2 test. Given DF=4, p=0.05, χ^2=7.779

	Group	
	A	B
Region 1	17	5
Region 2	25	21
Region 3	39	34
Region 4	42	49
Region 5	32	25

18. Calculate the standard deviation for the given data

    32, 44, 37, 53, 67, 61, 58, 39, 40, 55.

19. What are predatory journals? How can such journals be identified?

20. What are the stages of patent processing in India?

III. Answer any <u>TWO</u> of the following: (2×10=20)

21. Discuss quantitative research designs.

22. Illustrate the following data as a pie chart. What percentage production does wheat contribute?   (5+5)

Grain / Millet	Rice	Wheat	Coarse grains	Maize	Bajra
Overall production in Million metric ton	131	112	53	35	10

23. A drug trial was performed on three groups of candidates at different concentrations. Determine if the effect of the concentrations was significantly different. Given: at 5% F. Limit is 5.14

Group		Number of Patients with effective outcomes		
		Conc. A	Conc. A	Conc. A
	1	4	6	4
	2	6	5	5
	3	6	6	5

24. Discuss scientific misconduct: types, probable reasons, and outcomes.

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St Aloysius College (Autonomous)

Mangaluru

Semester II – P.G Examination – M.Sc. Biochemistry

ST. ALOYSIUS COLLEGE May/June - 2023
PG Library
MANGALORE-575 002 **BIOTECHNOLOGY**

Time: 3 Hours   Max. Marks: 70

I. **Answer any <u>TEN</u> sub-divisions of the following:**   (10x2=20)

1. How do you design a fermentation media?

2. Write the important steps involved in penicillin production.

3. Define concept of process variables.

4. Which type of bioreactor is suitable for plant cells and why?

5. Define cell synchronisation and add its applications.

6. How are mycoplasmas detected? Mention its control measure.

7. Define tissue engineering with applications.

8. Which are the different methods of cell viability tests in animal cells?

9. Write the important genes involved in golden rice.

10. Define protoplast fusion and mention its use in cell culture.

11. Write a note on germplasm conservation.

12. How do microorganisms degrade organo halogens?

II. **Answer any <u>SIX</u> of the following:**   (6x5=30)

13. Explain thermal death kinetics.

14. Describe microbial production and downstream processing of citric acid.

15. Write a note on adult and embryonic stem cells and their applications.

16. Explain in detail on cell lines.

17. Explain basic techniques of mammalian cell culture in vitro.

18. Describe anther culture.

19. Write a note on microbial bioremediation.

20. Explain delayed fruit ripening.

III. **Answer any <u>TWO</u> of the following:**   (2x10=20)

21. Explain microbiological treatment of solid wastes.

22. Describe monoclonal antibodies production and purification.

23. Explain isolation and improvement of industrially important strains.

24. Explain the development of herbicide resistant plants.

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