

PH 511.2

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St Aloysius College (Autonomous)

Mangaluru

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

July - 2022

ENZYMOLGY

Max. Marks: 70
(10x2=20)

Time: 3 Hours

I Answer any **TEN** sub-divisions of the following:

1. Distinguish between holoenzyme and apoenzyme.
2. Write a note on rate and order of a reaction.
3. What are coupled enzyme assays?
4. What is Ping Pong type of enzyme catalysed reaction?
5. Distinguish between metalloenzymes and metal activated enzymes. Give examples.
6. What are Abzymes? Give any two examples.
7. Define specific activity of an enzyme.
8. What is affinity labelling?
9. Give the significance of Haynes-Wolf and Lineweaver Burk equation.
10. Define turnover number.
11. What is nucleophilic catalysis?
12. What is stop-flow technique?

II Answer any **SIX** of the following:

(6x5=30)

13. Discuss any five factors which affect the activity of enzyme.
14. Enumerate the action of NAD⁺ and PLP as a coenzyme.
15. Using any two of serine protease enzymes concisely explain the mechanism of catalysis in detail.
16. Write a note on any four techniques used for enzyme immobilization.
17. What are multienzyme complexes? Explain with suitable example.
18. Derive Michaelis Menten's equation and discuss its significance.
19. Define active site of an enzyme. Explain anyone method for determining the active site.
20. Give the IUPAC classification of enzymes with an example.

III Answer any **TWO** of the following:

(2x10=20)

21. Explain KNF and MWC models of enzyme cooperative in oxygen binding to secondary plot in bisubstrate reactions.
22. What are different types of enzyme inhibition? How can they be distinguished kinetically?
23. Discuss the methods employed in purification and characterization of enzymes.
24. Discuss the diverse diagnostic application of following enzymes in Clinical Biochemistry.
 - a) Creatine Kinase
 - b) Lactate dehydrogenase
 - c) Alkaline phosphatase
 - d) Aminotransferase

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July -2022

METABOLISM

Max. Marks: 70

Time: 3 Hours

(10x2=20)

I Answer any TEN sub-divisions of the following:

1. What is Fabry's disease and Tay-Sach's disease?
2. What is P/O ratio?
3. Depict the action of PLA₂ on phosphatidyl choline.
4. Mention the differences between hormone sensitive and lipoprotein lipase.
5. What are anapleurotic reactions? Give an example
6. Enlist the clinical significance of ketone bodies.
7. Mention the biological significance of chylomicrons.
8. Enlist the physiological role of HMP pathway.
9. What is glucose paradox?
10. State the role of CPT I and CPT II in fatty acid oxidation.
11. Mention the differences between uncouplers and inhibitors of oxidative phosphorylation.
12. What is the process of reverse cholesterol transport?

II Answer any SIX of the following:

(6x5=30)

13. Explain the regulation of Phosphofructokinase-I.
14. Write the glyoxylate cycle. Explain its significance.
15. Describe the mechanism of ATP synthesis.
16. Give a detail account on glycogen storage disease.
17. Explain the lipid levels in pathological conditions.
18. Write a note on the Mitochondrial shuttles.
19. Discuss the biosynthesis of sphingolipids.
20. Write a note on the fates of pyruvate.

III Answer any TWO of the following:

(2x10=20)

21. Explain the β -oxidation of palmitic acid and pentadecylic acid and mention their energetics.
22. Describe the risk factors, pathogenesis, diagnosis and prognosis of atherosclerosis.
23. Discuss the organization, structure, and function of ETC components. Add a note on oxidative phosphorylation.
24. Write a detail note on the Glycogenesis and Glycogenolysis and their regulation.

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July - 2022

RESEARCH METHODOLOGY AND ETHICS

Time: 3 Hours

Max. Marks: 70

I Answer any **TEN** sub-divisions of the following:

(10x2=20)

1. Define Random Sampling.
2. Compare Primary and Secondary data.
3. List the different formats of bibliography.
4. What is the difference between technical report and a thesis?
5. Calculate arithmetic mean when Median is 14 and Mode is 11.
6. Why is median regarded as exact measure of central tendency?
7. What are mutually exclusive events? Give example.
8. Define correlation coefficient. What does $r=-1$ signify?
9. What is the significance of F statistical analysis?
10. Compare plagiarism and self-plagiarism.
11. List out the different citation indices.
12. Contrast Trademark and Register.

II Answer any **SIX** of the following:

(6x5=30)

13. Elaborate on importance of research.
14. Draw a pie diagram for the following data

| Crops | Area (In acres) |
|----------|-----------------|
| Rice | 16 |
| Wheat | 24 |
| Maize | 10 |
| Jowar | 8 |
| Milletts | 5 |

15. Write a note on different types of sampling with example.
16. Describe Completely Randomized Block Design.
17. Calculate the standard deviation for the following data
Variable = 30, 40, 70, 20, 60, 50, 10
18. Give an account on types of probability distribution.
19. Write a note on Scientific Conduct.
20. Elaborate on moral issues of biotechnology research.

III. Answer any **TWO** of the following:

(2x10=20)

21. Discuss the predatory publications and add a note on identification tools.
22. Explain rules and procedures governing Indian Patents
23. Calculate the probability of getting 0, 1, 2, 3 and 4 Heads when a coin is tossed four times.
24. Write a detailed note on thesis writing.

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BIOTECHNOLOGY

Time: 3 Hours

Max. Marks: 70

I Answer any TEN sub-divisions of the following:

(10x2=20)

1. What is somaclonal variation? Mention any two factors affecting production of somaclonal variants.
2. Define synthetic seeds. Write any two applications.
3. Give any two examples each for organo halogens and organisms degrading it.
4. What is cryopreservation? Mention any two uses.
5. What is histotypic culture? Mention any one advantage.
6. Define (a) Natural medium (b) synthetic medium used in animal culture.
7. Write differences between continuous and batch culture (any two)
8. List steps in inoculum development
9. Mention any two importance of amylase.
10. Differentiate between totipotent and pluripotent stem cells.
11. What is Ti Plasmid? Mention the name of a bacterium that naturally hosts it.
12. Mention the role of Genetic Engineering Approval Committee.

II. Answer any SIX of the following:

(6x5=30)

13. What is HAT medium? Explain its importance.
14. Illustrate how delayed ripening of fruits can be administered using transgenic technology.
15. Write a note on procedures used to isolate industrially important microbes with examples.
16. Write a note on activated sludge process highlighting any two advantages.
17. What is germplasm conservation? Describe the role of plant biotechnology in germplasm conservation.
18. What are GMOs? Add a note on reasons for taking precautions during release of GMOs with suitable examples.
19. What is tissue engineering? Describe its applications.
20. Write a note on down stream processes involved in production of any antibiotic.

III. Answer any TWO of the following:

(2x10=20)

21. Discuss the process of citric acid production.
22. Discuss adult and embryonic stem cell and its application.
23. Define biofertilizer. Give a detailed account on importance, types and applications.
24. Discuss the various methods of gene transfer in plants. Add a note on marker assisted selection.