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St Aloysius College (Autonomous)
Mangaluru
Semester II- P.G Examination – M.Sc. Biochemistry
May - 2024
ENZYMOLGY

Time: 3 Hours

Max. Marks: 70

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

1. Define catalytic power of enzymes.
2. What role do metal ions play in the catalytic activity of metalloenzymes and metal-activated enzymes?
3. Define an end point assay for enzyme activity measurement. How does it differ from continuous assays?
4. What is the purpose of isolating enzymes from biological sources?
5. Give the Cleland notation for SGOT enzyme reaction.
6. What is the role of inhibitors in enzyme kinetics?
7. Define Serine proteases and outline their significance in biological systems
8. How do enzymes differ from inorganic catalysts?
9. Name a therapeutic enzyme used to treat i) acute lymphoblastic leukemia
ii) Phenylketonuria
10. Analyse the potential effects of phosphorylation on enzyme activity
11. What are activators in enzyme catalysis? Give examples.
12. What are the primary objectives of enzyme purification?

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

13. Can you differentiate between hydrolases and lyases in terms of their catalytic mechanisms?
14. Describe the concept of specific activity and its role in determining enzyme purity. How is specific activity calculated, and what does it indicate about enzyme preparations?
15. Explain the method of stopped flow of fast reaction kinetics of enzyme study.
16. Explain the methods used for isolating enzyme substrate complex to determine active site structure
17. Discuss the importance of cofactor Biotin
18. Outline the coenzymic role of folic acid
19. Describe the clinical significance of measuring Creatine Kinase activity
20. Explain the significance of K_m and V_{max} values in enzyme characterisation after purification.

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

21. How do monomeric enzymes differ from oligomeric enzymes in terms of their quaternary structure?
22. How does linear transformation facilitate the determination of kinetic parameters from experimental data?
23. Illustrate the mechanism by which lysozyme functions
24. Discuss the diverse diagnostic applications of following enzymes in clinical biochemistry i) Alkaline phosphatase ii) Lactate dehydrogenase

St Aloysius College (Autonomous)**Mangaluru****Semester II- P.G Examination – M.Sc. Biochemistry****May -2024****METABOLISM****Time: 3 Hours****Max. Marks: 70****I Answer any TEN sub-divisions of the following:****(10x2=20)**

1. Justify the statement "Carnitine is useful in fatty acid oxidation".
2. Distinguish between anabolic and amphibolic pathways.
3. What is Cori's cycle? Mention its significance
4. Define Pasteur's effect.
5. What is GTT? How is it relevant in diagnosis of diabetes?
6. What is Q cycle? Mention its significance
7. What are ketone bodies? Mention their significance
8. Define omega oxidation.
9. What is lactose intolerance?
10. What are foam cells? Mention their significance
11. What is glucose paradox?
12. Distinguish between uncouplers and inhibitors of ETC.

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

13. Write an account on integration of carbohydrates and lipid metabolism.
14. Enlist the reactions involved in the β -oxidation of fatty acids.
15. Give a note on the atherosclerosis.
16. Elaborate on the denovo synthesis of fatty acids.
17. Discuss the Mitchell's hypothesis.
18. Explain the structure of ATP synthase and write the role of each component.
19. Describe the HMP shunt pathway.
20. Discuss the gluconeogenesis.

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

21. Explain in detail about the citric acid cycle and its regulation.
22. Discuss in detail about organization of respiratory chain complexes.
23. Describe the biosynthesis of prostaglandins and thromboxanes.
24. Write a note on inherited human disease with membrane lipid accumulation.

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Semester II- P.G Examination – M.Sc. Biochemistry
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RESEARCH METHODOLOGY AND ETHICS

Time: 3 Hours

Max. Marks: 70

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

1. What is design of experiment
2. Enlist the purpose of data collection
3. Define qualitative research and give example.
4. What is non probability sampling and give example
5. Define the term "binomial distribution".
6. State the multiplication rule of probability.
7. Can you explain why kurtosis is sometimes referred to as the "peakedness" or "tailedness" of a distribution?
8. Explain why correlation does not imply causation.
9. Define standard deviation.
10. Differentiate between national and international patents
11. Define intellectual property right
12. Enlist the guiding principles of research ethics

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

13. Explain the basic steps involved in science research
14. Write the difference between qualitative and quantitative research
15. A cross is made between guinea pigs with black male and the grey female, the offsprings obtained were 50 black and 70 grey out of 120 pigs. Calculate chi square and interpret the results. (p value from table at 0.05 is 3.84) (ratio is 3:1).
16. A researcher wants to compare the mean exam scores of two groups of students: one group received tutoring and the other did not. Discuss the appropriate choice between an independent samples t-test and a paired samples t-test for this comparison, and describe the steps involved in conducting and interpreting the chosen test.
17. Discuss the interpretation of unimodal, bimodal, and multimodal distributions.
18. Write note on redundant publication
19. Evaluate the importance scientific conduct in Research
20. Explain about patenting of genes and product

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

21. Discuss about randomized block design
22. Compare and contrast simple linear regression with multiple linear regression, discussing their assumptions, applications, and interpretations.
23. Describe various types of graphical representations of data
24. Discuss the importance of citation indexes in publication

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BIOTECHNOLOGY

Time: 3 Hours

Max. Marks: 70

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

(10x2=20)

1. How does fermentation contribute to the transformation of grape juice into wine?
2. Differentiate between Fixed bed and fluidized bed bioreactor.
3. What is the main purpose of cryopreserving cells in cell culture?
4. Give two common methods for mycoplasma detection in cell cultures.
5. Analyze the importance of plant breeding in disease free stock maintenance?
6. Evaluate the importance of germplasm conservation
7. Write the principle of MTT assay.
8. Write a note on industrial applications of citric acid.
9. Define tissue culture media and give example.
10. Define biofertilizers
11. Give examples for plastic-eating bacteria and its significance in plastic waste management
12. What is thermal death kinetics?

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

(6x5=30)

13. Explain the basic design of a fermentor.
14. Evaluate the diverse applications of monoclonal antibodies in research, diagnostics, and therapeutics.
15. Describe the basic steps involved in anther culture
16. Discuss about methods of protoplast isolation
17. Explain the steps involved in the isolation of a specific industrially important microorganism from a natural environment.
18. Describe the process of establishing a primary culture from animal tissues, highlighting key steps.
19. Define Tissue culture media and writes its composition
20. Differentiate between defined and undefined media, providing examples of each.

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

(2x10=20)

21. With respect to tissue engineering describe adult and embryonic stem cells. Add a note on its applications
22. Analyze various technique used in gene transfer in plants
23. Analyze the importance of microbial remediation with example
24. Discuss on hybridoma Technology.
