

PH 511.2

Reg. No:

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St Aloysius College (Autonomous)
Mangaluru
Semester II - P.G. Examination - M.Sc. Biochemistry
April - 2019
ENZYMOLGY

Time: 3 Hours

Max.Marks:70

I Answer any TEN of the following:

(10×2=20)

1. Distinguish between holoenzyme & apoenzyme.
2. Define isoenzyme with an example.
3. Define cofactor & prosthetic group with an example.
4. What is orbital steering?
5. What is salting out effect?
6. Define turnover number with examples.
7. What is an allosteric inhibitor?
8. Define ribozyme with examples.
9. How do zymogens work?
10. What is scatchard plot?
11. Give Cleland notation for alanine aminotransferase
12. Define Katal.

II Answer any SIX of the following:

(6×5=30)

13. Explain the different classes of enzymes.
14. Write the effect of temperature and pH on enzyme activity.
15. Explain the different methods used for the assay of enzymes.
16. Derive Michaelis Menten equation.
17. Write short notes on methods used to study fast reaction kinetics.
18. Explain irreversible covalent modification of enzymes with two examples.
19. Give a brief account on methods of determining active site structure.
20. Write a short note on steps for purification of enzyme.

III Answer any TWO of the following:

(2×10=20)

21. Give a detailed note on clinical application of enzymes.
22. Explain the mechanism of action of ribonuclease
23. Explain the MWC and KNF models for action of allosteric enzymes.
24. Explain competitive, non-competitive and uncompetitive inhibition using Lineweaver-Burk plot.

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St Aloysius College (Autonomous)
Mangaluru
Semester II - P.G. Examination - M.Sc. Biochemistry
April 2019
METABOLISM

Time: 3 Hours

Max.Marks:70

I Answer any TEN of the following:**(10×2=20)**

1. Although O₂ is not involved in any step of TCA cycle yet the cycle is aerobic. Justify.
2. What is Pasteur's effect?
3. What is Malate-aspartate shuttle?
4. What are the allosteric regulators of PFK?
5. What is Mitchell's hypothesis?
6. What is glyoxylate cycle? Which enzymes are unique to glyoxylate cycle?
7. What is ω-oxidation?
8. What is P/O ratio? What is the ratio for NADH oxidation?
9. What is the role of CDP in phospholipid biosynthesis?
10. What are triglycerides? What causes triglycerides level to be high?
11. Give clinical features of Fabry's disease.
12. What are apolipoproteins?

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II Answer any SIX of the following:**(6×5=30)**

13. Give an account of the fates of pyruvate.
14. Explain the non-equilibrium reactions of glycolysis.
15. Explain the Q cycle.
16. What are uncouplers? How do they affect ETC and ATP synthesis in mitochondria?
17. Describe Boyer's binding change mechanism.
18. How are fatty acids desaturated in plants?
19. Give the schematic conversion of linoleic acid to arachidonic acid.
20. Explain the mechanism involved in reverse cholesterol transport by HDL.

III Answer any TWO of the following:**(2×10=20)**

21. Give an account of the citric acid cycle and its regulation.
22. How are electrons transferred in ETC. How is this linked to proton translocation?
23. Outline the β-oxidation of saturated fatty acid and add a note on its energetics.
24. Describe the metabolic defects in the following disorders.
 - a) Diabetes mellitus
 - b) Atherosclerosis

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Semester II - P.G. Examination - M.Sc. Biochemistry
April 2019

CLINICAL TOXICOLOGY

Time: 3 Hours

Max.Marks:70

(10×2=20)

I Answer any **TEN** of the following:

1. Mention different routes of drug administration.
2. What is the difference between acute and chronic toxicity?
3. What is maximum tolerated dose?
4. Define nephrotoxicity. Give example.
5. Write the difference between diuresis & dialysis.
6. What are activational toxicants?
7. What is the Lipinski's rule of five for a drug molecule?
8. Define NOEL.
9. Write the difference between Cox1 and Cox2.
10. What are kepones?
11. What are opioids? Give example.
12. What are drugs of abuse? Give examples.

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

(6×5=30)

13. What is LD₅₀ & ED₅₀ value? Explain the calculation.
14. Write a note on dose-response relationship.
15. Explain the mechanism of toxicity caused by CCL₄.
16. Explain different methods to elevate threshold of toxicity.
17. Write about Phase-II conjugation reaction.
18. Explain in detail mechanism of action of any two antimicrobial agents.
19. Explain the mechanism of action of cyclophosphamide.
20. Write about types of toxic response on respiratory system.

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

(2×10=20)

21. What is clinical trial? Explain different phases involved in clinical evaluation of new drug.
22. What is antidotal therapy? Explain antidotal procedure to decrease absorption of toxicants.
23. Explain mechanism and effects of neurotoxicity and endocrine toxicity.
24. Explain the mechanism of action of two drugs of GIT and cardiovascular disorders. Add a note on their adverse effect.

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Semester II - P.G. Examination - M.Sc. Biochemistry
April 2019
BIOTECHNOLOGY

Time: 3 Hours

Max.Marks:70

I Answer any TEN of the following:

(10×2=20)

1. Name two each industrially important microbes for the production of citric acid and butanol.
2. Mention the components used for the beer production with respect to fermentation.
3. If you are given a culture media, which gets denatured by heat, what will be your approach to sterilize it. Justify your answer.
4. Name the components in the fermenter which is used for aeration and agitation.
5. What is the role of aseptic conditions in animal cell culture?
6. What is the role of CO₂ in animal cell culture.
7. What is callus? How it can be induced to produce shoot?
8. What are monoclonal antibodies? Name any two applications of it?
9. What are the essential requirements of plant tissue culture laboratory.
10. Name the additional genes present in golden rice.
11. What is somaclonal variation? Name the methods to detect somaclonal variants.
12. Name any one organization degrading microbe and its mechanism of degradation.

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II Answer any SIX of the following:

(6×5=30)

13. What are the strategies for the isolation and improvement of industrially significant microbes.
14. Discuss the principle and approaches for batch fed batch and continuous mode fermentation.
15. Describe the characteristics of cell lines. Add a note on the maintenance of cell line.
16. With appropriate diagram, describe the various stages of hybridoma technology.
17. Discuss in detail about single cell proteins.
18. What is cytotoxicity? Describe the principle and approaches to study it.
19. Explain the conservation methods for germ plasm.
20. With respect to GMO'S describe the following
 - a) Environmental release and monitoring.
 - b) Ethical issues

III Answer any TWO of the following:

(2×10=20)

21. Describe the basic structure and components of Bioreactor.
22. With respect to tissue engineering describe adult and embryonic stem cells. Add a note on its applications.
23. Explain the various gene transfer techniques in plants.
24. How can microbes be useful in protecting the environment. Justify with appropriate examples.

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St Aloysius College (Autonomous)
Mangaluru

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

November - 2017

BIOMOLECULES

Time: 3 Hours

Max. Marks: 70

I. Answer any TEN of the following:

(10×2=20)

1. What are enantiomers? Give example.
2. What is the torsion angles in β -bend?
3. Write the structure of sucrose. Why is it a non reducing sugar?
4. How dideoxy nucleotide are useful in sequencing?
5. What are lectins? Mention its uses.
6. Give an example of a ω -3 fatty acid. Why is it labeled as ω -3?
7. What is chargaff rule?
8. Why DNA is more stable than RNA in alkali?
9. What is meant by melting temperature of DNA? Explain.
10. What are amino sugars? Write the structure of any one.
11. What are homopolysaccharides & heteropolysaccharides? Give examples.
12. Write the Zwitter ionic properties of amino acids.

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II. Answer any SIX of the following:

(6×5=30)

13. Explain α -helical and β -pleated sheets secondary structure of protein.
14. Write the characteristics of O-linked and N-linked oligosaccharides.
15. Explain triple helical structure of DNA and cruciform DNA.
16. Write a note on physico chemical properties of fats.
17. Write a note on bacterial cell wall peptidoglycans.
18. Explain thermodynamics of protein folding.
19. Write about Primary, secondary and tertiary structure of tRNA.
20. Explain Ramachandran's plot.

III. Answer any TWO of the following:

(2×10=20)

21. Explain steps involved in chemical synthesis of a peptides.
22. How to determine amino acid sequence of polypeptide chain by chemical and enzymatic method? Explain.
23. Give an account of classification, structure and biological properties of glycoproteins.
24. Explain the sequencing of DNA by Maxam Gilbert method. How it is different by Sanger's method?

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Semester II - P.G. Examination - M.Sc. Biochemistry
April 2018

ENZYMOLGY

Time: 3 Hours

Max.Marks:70

I Answer any TEN of the following:

(10×2=20)

1. How are enzymes classified?
2. Define IU and Katal.
3. What is the significance of K_m and V_{max} ?
4. What is meant by Turnover number of an enzyme? How is it calculated?
5. Give Cleland's notations for bisubstrate reactions.
6. What is K_i ? How is it determined?
7. What is a transition state?
8. What are zymogens? Give an example.
9. What are Abzymes? What is their significance?
10. Explain coupled enzyme assay with an example.
11. Why are enzymes called "biocatalysts"?
12. How do proximity and orientation contribute to enzyme catalysis?

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II Answer any SIX of the following:

(6×5=30)

13. What are the effects of pH and temperature on enzyme catalysed reactions?
14. What are the criteria used to describe the purity of isolated enzymes?
15. Derive an expression for the velocity of an enzyme catalysed reaction by Michaelis -Menten approach.
16. Give an account of reversible covalent modifications of enzymes.
17. How are kinetic constants of bisubstrate reactions determined using primary and secondary plots?
18. Explain the coenzyme action of NAD^+ and TPP.
19. How are competitive, non competitive and uncompetitive inhibitions distinguished graphically?
20. What are metalloenzymes? How are they different from metal-activated enzymes? Explain.

III Answer any TWO of the following:

(2×10=20)

21. Discuss the catalytic mechanism of chymotrypsin.
22. Explain MWC and KNF models of allosteric enzymes.
23. Give an account of the clinical applications of enzymes.
24. With a suitable example discuss the mechanism of action of a multi-enzyme complex.

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

April - 2018

METABOLISM

Time: 3 Hours

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I. Answer any TEN of the following:

(10×2=20)

1. State the site of action of different phospholipases on phosphatidylcholine.
2. Define Photorespiration.
3. Give two examples each for uncouplers and inhibitors of ETC.
4. Define P/O ratio.
5. Define Proton motive force.
6. With an example, write a short note on amphibolic pathway.
7. What are Ether lipids? Give an example.
8. What is ω -oxidation?
9. What are anapleurotic reactions? Give an example.
10. Write the function of prostaglandins.
11. Give the fate of acetyl Co A.
12. What are oxidized lipoproteins? Give example.

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II. Answer any SIX of the following:

(6×5=30)

13. Explain glycerol phosphate and malate-aspartate shuttle systems.
14. Give a detailed account on integration of carbohydrate and lipid metabolism.
15. Discuss the receptor mediated endocytosis in case of LDL.
16. Explain the regulation of PFK.
17. Write a note on genetic disorder related to phospholipid metabolism.
18. Write the similarities and differences between TCA cycle and glyoxylate cycle.
19. Write a note on glycolysis.
20. Write a note on cori cycle.

III. Answer any TWO of the following:

(2×10=20)

21. Discuss the biosynthesis and degradation of HDL and LDL.
22. Describe the structure, mechanism of functioning of ATP synthase complex.
23. Give a detailed account on Electron transport chain.
24. Explain β -oxidation and Energetics of oxidation of palmitic acid.

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Time: 3 Hours

I Answer any **TEN** of the following:

Max.Marks:70

(10×2=20)

1. Mention the sources of drugs and routes of drugs administration.
2. Which organ is most vulnerable to organophosphate and heavy metal toxicity.
3. What would be the maximum tolerance dose?
4. In the In vitro experiments we use 100% inhibitor concentration. But in the in vitro experiments we use only 50% inhibitor concentration. Why?
5. Define pharmacokinetics.
6. Mention the causes for nephrotoxicity.
7. The diagnostic report indicates that taking too much NSAID's are responsible for Gastro intestinal ulceration, How NSAID's cause such side effects?
8. What is an emphysema effect?
9. Name the drugs used in the treatment of bronchial asthma and peptical ulcer.
10. Give a short note on estrogenic pharmaceuticals.
11. In any kind of injury we take pain killers eg. ibuprofen, they simply reduce pain, what would be the mechanism behind this?
12. What is the mechanism by which ampicillin stops infection?

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

(6×5=30)

13. Define Acute, sub-acute and chronic toxicity studies.
14. Briefly explain the anti-inflammatory drugs and their mechanism of action.
15. Explain the mechanism of action of barbiturate and benzodiazepines.
16. Describe the different opioids effects.
17. Explain new drug development process and registration.
18. Mention the methods to elevate threshold of toxicity.
19. Give a account on endocrine toxicants and their effects.
20. Write a brief note on mechanism of action of cyclophosphamide.

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

(2×10=20)

21. Describe the phases of clinical trial, ethics and protocol.
22. Write the different phases of detoxification and explain in detail.
23. Explain the mechanism of action of at least two antimicrobial agents in detail.
24. Discuss different drug delivery systems.

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BIOTECHNOLOGY

Time: 3 Hours

Max. Marks: 70

I Answer any **TEN** of the following:

(10×2=20)

1. What are haploid plants? Name the source of tissue or explants for their products.
2. How do the stem cells differ from other somatic cells?
3. What is fed-batch culture?
4. Define histotypic culture.
5. What is somatic embryogenesis? Mention its uses.
6. What is HAT medium? Why is it used?
7. What are xenobiotics? Give an example.
8. What are cryoprotectants? Mention different types of cryoprotectants.
9. What is Bt cotton?
10. What are SCPs?
11. What are GMOs? Give an example.
12. What is the role of serum in cell culture media?

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

(6×5=30)

13. Explain the importance of germplasm conservation & its application.
14. How do you detect mycoplasma contamination in tissue culture?
15. How are tissues disaggregated for cell culture?
16. Write a note on basic design of ferment.
17. What are the different criteria for isolation of industrially important microorganisms?
18. What is somaclonal variation? What is its importance?
19. Explain thermal death kinetics.
20. Outline the steps involved in micropropagation. What are the factors influencing the micropropagation.

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

(2×10=20)

21. What are transgenic plants? Explain the procedure used for production of transgenic plants with suitable examples.
22. Explain the microbial bioremediation.
23. Describe production, purification and application of monoclonal antibodies.
24. Explain microbial production of wine and beer.
