Sree Narayana College, Kollam

Model Exam December 2016-Semester-I, Botany and Zoology

Complementary course BC 1131-Biophysical Chemistry

Time: 3hours **Maximum Marks: 80**

Section I (Very Short Answer maximum 2 sentences) **(10x1=10marks)**

(Answer all questions)

1. Define sol. Give an example
2. What is a buffer? Give two examples
3. Define an acid and a base according to Arrhenius concept.
4. What is the principle of chromatography?
5. Differentiate between osmosis and diffusion.
6. What do you mean by physiological saline.
7. What is Tyndall effect?
8. What is colligative property?
9. Define hypotonic and hypertonic solution
10. Define molality

Section-II (Short Answer Questions-not to exceed one paragraph) **(8x 2 = 16 marks)**

Answer any eight questions

11 What are enantiomers?
12 What are stabilizers?
13 Define molarity. How will you prepare a 0.5M solution of NaOH (MW-40)?
14 Write about ultracentrifugation.
15 What is 2-Dimensional gel electrophoresis?
16 Illustrate the formation of a peptide bond
17 Distinguish between true solution and colloidal solution
18 Calculate the normality of 10% solution of NaOH.
19 Write about isoelectric focussing
20 What is the significance of glycosidic linkage?
21 If a solution has a pH of 5.50 at 25 ^{o}C. Calculate its [OH^-].
22 Write the difference between native and SDS-PAGE?

Section-III (Short Essay-not to exceed 120 words) **(6 x 4 = 24 marks)**

Answer any six questions

23 Discuss about ion product of water
24 Give an account of colloids.
25 Explain gel filtration.
26 Comment briefly on the process of osmosis and its biological significance
27 Describe the principle and instrumentation of spectrophotometer?
28 Calculate the pH of a solution which is 0.01N for NaOH.
29 Explain the technique of affinity chromatography.
30 Discuss about the common functional groups present in biomolecules?
31 Give an account of glycosidic bond

Section-IV (Long Essay) **(15 x 2 =30 marks)**

Answer any two questions

32 Derive Handerson-Hasselbalch equation and the conditions at which a buffer shows maximum buffering capacity.
33 Explain SDS-PAGE as a suitable technique for the separation of proteins.
34 Essay on isomerism, classification with examples.
35. Explain Donnan Membrane equilibrium and its biological significance?

Sree Narayana College, Kollam

Model question, July 2016-Semester II, Zoology/Botany Main; Course Code-BC1231 Total – 80

Complementary Course-Biochemistry- Biomolecules

Section I (Very Short Answer Type-max 2 sentences) Answer all questions **(10x1=10)**

1. Give the structure of adenine
2. What are the soluble and insoluble part of starch?
3. Write about Moilsch's test
4. What are zwitter ions?
5. What are the bonds present in DNA?
6. What is Chargaff's rule?
7. How many peptide bonds are present in a tripeptide?
8. What is the difference between fat and oil?
9. Give the structure of fructose.
10. What is acrolein test?

Section II (Short Answer Questions-Not to exceed one para) Answer any eight questions **(8x2=16)**

11. Give the structure of sucrose.
12. What is mutarotation?
13. Give an account of phospholipids. Give examples
14. Discuss thyroid hormones
15. Distinguish between saponification number and iodine number
16. Give the structure of cholesterol.
17. Distinguish between cAMP and cGMP.
18. What are essential fatty acids?
19. What is RM value?
20. Give an account of different types of RNA
21. Give any two chemical reactions of steroids
22. What are epimers? Give the structure of epimers of glucose.

Section III (Short essay-not to exceed 120 words) Answer any six questions) **(6 x 4= 24)**

23. What are mucopolysaccharides? What are their functions
24. Mechanism of action of steroid hormones
25. Color reactions of carbohydrates
26. What are sphingolipids? Give examples
27. How are lipids classified?
28. What are the different types of DNA?
29. Give the structure and site of synthesis of adrenaline and noradrenaline.
30. Give the structure and properties of cellulose
31. Discuss about the reduction tests of sugars.

Section IV (Long Essay) Answer any two questions **(15 x 2= 30)**

32. How the carbohydrates are classified.Write a note on dissacharides.
33. Write an essay on classification of amino acids
34. Explain the structural features of DNA
35. Discuss various steroid hormones with structure

Sree Narayana College, Kollam
Model Exam October 2016-Semester-III, Botany and Zoology
Complementary course BC 1331Enzymes and Bioenergetics

Time: 3hours **Maximum Marks: 80**

Section I (Very Short Answer Type- maximum 2 sentences)
(Answer **all** questions) (10x1=10 marks)

1. Which are the fat soluble vitamins?
2. What is hypervitaminosis?
3. What are high energy compounds? Give 2 examples
4. Write about the deficiency disease of Vit D
5. What do you mean by redox couple?
6. Which are the organellaes involved in photorespiration.
7. What is provitamin, give an example
8. What do you mean by holo enzymes?.
9. What is nitrogenase complex?
10. What is anti egg white injury factor?

Section-II
(Short Answer Questions-not to exceed one paragraph)
Answer any **eight** questions (8 x 2 = 16 marks)

11. What are the features of Km value
12. What are the symptoms of xerophthalmia?
13. Explain L-B plot.
14. What is the significance of nitrogenase enzyme
15. Name two uncoupling agents of electron transport chain. How do they act?
16. What is meant by P/O ratio? Mention its significance in respiration?
17. Give the functions and sources of vitamin E
18. Give the structure of ATP.
19. Discuss about ATP synthase
20. Discuss about the various respiratory chain inhibitors
21. What are coenzymes, give examples
22. What is specific activity

Section-III
(Short Essay-not to exceed 120 words)
Answer any **six** questions (6 x 4 = 24 marks)

23. Explain the importance of Vit B_{12}
24. Comment on double reciprocal plot.
25. Note on nitrogen assimilation
26. List the electron carriers in mitochondrial electron transport
27. Deficiency disease and source of of Vit C
28. Explain oxygen dissociation curve
29. Differentiate oxidative and substrate level phosphorylation
30. Describe chemiosmotic hypothesis
31. Detail the factors affecting enzyme activity

Section-IV (Long Essay)
Answer any **two** questions (15 x 2 =30 marks)

32. Calvin cycle with explanation
33. Explain mitochondrial electron transport
34. Explain the different types of enzyme inhibitions
35. Coenzyme forms of vitamins with examples of reaction.

Sree Narayana College, Kollam

Model Exam June 2016-Semester-IV, Botany and Zoology

Complementary course BC 1431-Intermediary Metabolism

Time: 3hours **Maximum Marks: 80**

Section I (Very Short Answer maximum 2 sentences)

(Answer all questions) **(10x1=10marks)**

1. Name primary and secondary bile acids.
2. What is omega oxidation?
3. Write down the rate limiting steps of glycolysis
4. What is Wobble hypothesis?
5. What are okazaki fragments?
6. What are histones.
7. Which are the essential fatty acids?
8. What are DNA polymerases?
9. Name the site at which the following occurs: Glycolysis, gluconeogenesis?
10. What are zymogens?

Section –II (Short Answer Questions-not to exceed one paragraph)

Answer any eight questions **(8 x 2=16)**

11. Write a note on the fate of pyruvate formed during glycolysis.
12. What are ketone bodies? 'Liver cannot utilize ketone bodies' Why?
13. Give the features of mRNA?
14. What is transamination reaction? Give two examples?
15. What is limit dextrin?
16. Draw the structure of tRNA.
17. What are endopeptidases? Give two examples.
18. List the enzymes involved in TCA cycle
19. Give an account of codon-anticodon recognition.
20. Define genetic code.
21. How glucose is activated in glycogenesis
22. Write a note on RNA polymerase

Section –III (Short Essay- not to exceed 120 words)

Answer any six questions **(6 x4=24marks)**

23. Explain the double helical structure of DNA.
24. Give an account of the zymogen activation of proteolytic enzymes of GI tract
25. Briefly explain the absorption of amino acids in the GI tract.
26. Describe cori's cycle and its significance
27. What are the physiological functions of phospholipids?
28. How is ammonia detoxified in the body?
29. Calculate the ATP yield upon the complete oxidation of palmitic acid with steps involved.
30. Give the significance of citric acid cycle.
31. Give an account of the irreversible steps of glycolysis.

Section-IV (Long Essay)

Answer any two questions **(15 x 2=30 marks)**

32. Illustrate scheme of β-oxidation and ATP yield.
33. Explain HMP shunt pathway and its significance.
34. Explain Glycogen metabolism and the role of hormones in metabolic regulation.
35. Describe in detail the process of prokaryotic protein biosynthesis.

Sree Narayana College, Kollam

Model question, June 2017-Semester II, Zoology/Botany Main; Course Code-BC1231

Complementary Course-Biochemistry- Biomolecules

Section I (Very Short Answer Type-max 2 sentences) Answer all questions **(10x1=10)**

1. Illustrate peptide bond.
2. Give an account of Glucagon
3. Write about bial's test
4. What are zwitter ions?
5. What are the bonds present in DNA?
6. What are nucleotides?
7. How many peptide bonds are present in a tripeptide?
8. What is the difference between fat and oil?
9. Give the structure of galactose
10. What is acrolein test?

Section II (Short Answer Questions-Not to exceed one para) Answer any eight questions **(8x2=16)**

11. Give the structure of adrenaline and noradrenaline
12. Give an account of glycolipids. Give examples
13. Distinguish between saponification number and iodine number
14. Give the structure of cholesterol.
15. Distinguish between cAMP and cGMP.
16. What are essential fatty acids?
17. What is RM value?
18. Give any two chemical reactions of steroids
19. What are the different purine and pyrimidine bases?
20. Glucose and fructose will form identical osazones. Why?
21. Distinguish between cyclic AMP and cyclic GMP.
22. Give the Haworth projection formula of glucose and fructose

Section III (Short essay-not to exceed 120 words) Answer any six questions) **(6 x 4= 24)**

23. Give an account of steroid hormones.
24. Color reactions of carbohydrates
25. What are phospholipids? Enumerate the functions of phospholipids.
26. How are lipids classified?
27. Give the structure and site of synthesis of T3 and T4.
28. Give the structure and properties of cellulose
29. Discuss about the reduction tests of sugars.
30. What are epimers? Give the structure of epimers of glucose
31. Mechanism of action of steroid hormones

Section IV (Long Essay) Answer any two questions **(15 x 2= 30)**

32. How the carbohydrates are classified. Write the principle of the following test
    (a) Molisch's (b) seliwanoff's
33. Describes the primary, secondary and tertiary structure of proteins.
34. Explain the structural features of DNA
35. Illustrate the structure and biological functions of different types of RNA's

Sree Narayana College, Kollam

Model Exam June 2017-Semester-IV, Botany and Zoology

Complementary course BC 1431-Intermediary Metabolism

Time: 3hours **Maximum Marks: 80**

Section I (Very Short Answer maximum 2 sentences)

(Answer all questions) **(10x1=10marks)**

1. Write down the rate limiting steps of glycolysis
2. What is ~~Wobble hypothesis?~~ the site of β-oxidation?
3. What are okazaki fragments?
4. Write on ribosomes.
5. Name two essential fatty acids?
6. Where is anticodon found?
7. Name the site at which the following occurs: Glycolysis, citric acid cycle?
8. What is glycogenin?
9. Name primary and secondary bile acids.
10. What is omega oxidation?

Section –II (Short Answer Questions-not to exceed one paragraph)

Answer any eight questions **(8 x 2=16)**

11. What is the function of Rho factor in transcription?
12. Give two functions of phospholipids.
13. Give the features of mRNA?
14. What is transamination reaction? Give two examples?
15. What is shine dalgarno sequence?
16. Draw the structure of tRNA.
17. What are endopeptidases? Give two examples.
18. Give an account of codon-anticodon recognition.
19. Define genetic code. Discuss its salient features.
20. Central dogma of life, illustrate.
21. How bile acids acids are formed?
22. What are nucleosomes?

Section –III (Short Essay- not to exceed 120 words)

Answer any six questions **(6 x4=24marks)**

23. Give an account of urea cycle.
24. Briefly explain the absorption of amino acids in the GI tract.
25. Describe cori's cycle and its significance
26. What are ketone bodies? How are they formed?
27. How is ammonia detoxified in the body?
28. Calculate the ATP yield upon the complete oxidation of palmitic acid with steps involved.
29. Illustrate the non-oxidative phase of HMP shunt pathway
30. Give an account of glycogenesis
31. Explain relication of DNA.

Section-IV (Long Essay)Answer any two questions **(15 x 2=30 marks)**

32. Give an account of the reactions of kreb's cycle. Calculate the ATP formed
33. Explain Glycolysis
34. Describe in detail the process of prokaryotic transcription.
35. Illustrate scheme of β-oxidation and ATP yield of one mole of stearic acid.

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Sree Narayana College, Kollam
Model Exam November 2018-Semester-I, Botany and Zoology
Complementary course BC 1131-Biophysical Chemistry

Time: 3hours **Maximum Marks: 80**

Section I (Very Short Answer maximum 2 sentences)
(Answer all questions) **(10x1=10marks)**

1. pH of a solution is 6. Find out the pOH of the solution.
2. Define an acid and a base according to Arrhenius concept.
3. What is Svedberg constant?
4. Differentiate between osmosis and diffusion.
5. What is molar extinction coefficient?
6. What is protection?
7. What is colligative property?
8. Define hypotonic and hypertonic solution
9. How are peptide bonds formed?
10. Define molality

Section-II (Short Answer Questions-not to exceed one paragraph)
Answer any eight questions **(8x 2 = 16 marks)**

11 What are emulsions and emulsifying agents? Which is the emulsifying agent in milk?
12 Define molarity. How will you prepare a 2M solution of NaOH (MW-40)?
13 Write the principle of gel filtration
14 What is 2-Dimensional gel electrophoresis?
15 Illustrate the formation of a peptide bond
16 Distinguish between true solution and colloidal solution
17 Name the functional groups in glyeraldehyde.
18 Write about isoelectric focussing
19 What is the significance of glycosidic linkage?
20 Write the difference between native and SDS-PAGE?
21 State Beer – Lambert's Law and its application
22 What are the functions of SH group?

Section-III (Short Essay-not to exceed 120 words)
Answer any six questions **(6 x 4 = 24 marks)**

23 List the differences between a lyophobic and lyophilic colloid
24 Explain thin layer chromatography
25 Give a short note on stereoisomerism?
26 Explain the technique of affinity chromatography.
27 Discuss about the common functional groups present in biomolecules?
28 Give an account on the classification of isomers?
29 What is Donnan membrane equilibrium? What is its biological significance.
30 Discuss about ion product of water
31 Brief covalent interactions in biological system

Section-IV (Long Essay)
Answer any two questions **(15 x 2 =30 marks)**

32 Detailed note on isomerism
33 Explain Handerson Hasselbalch equation.
34 Explain SDS-PAGE as a suitable technique for the separation of proteins.
35 Describe the different methods of expressing the concentration of solution

Sree Narayana College, Kollam

Model question, June 2018-Semester II, Zoology/Botany Main; Course Code-BC1231

Complementary Course-Biochemistry- Biomolecules

Section I (Very Short Answer Type-max 2 sentences) Answer all questions **(10x1=10)**

1. Give the structure of glycine.
2. Write about insulin.
3. Give the names of two reduction test of carbohydrates.
4. Draw the structure of cholesterol.
5. What is chargaffs rule?
6. What are lipids?
7. Mention four nitrogenous bases in RNA.
8. What is the difference between fat and oil?
9. Give the structure of fructose
10. What is acrolein test?

Section II (Short Answer Questions-Not to exceed one para) Answer any eight questions **(8x2=16)**

11. Give an account of phospholipids. Give examples.
12. Distinguish between saponification number and iodine number
13. What is the significance of SH group in proteins
14. Distinguish between lecithin and cephalin.
15. What is RM value?
16. Give any two chemical reactions of steroids
17. Explain molisch's test
18. Distinguish between cyclic AMP and cyclic GMP.
19. Give the Haworth projection formula of glucose and fructose
20. Distinguish between reducing and nonreducing sugars.
21. What is mutarotation. Give its mechanism.
22. Give the structure of tRNA.

Section III (Short essay-not to exceed 120 words) Answer any six questions) **(6 x 4= 24)**

23. Give an account of steroid hormones.
24. Differentiate between starch and cellulose.
25. What are phospholipids? Enumerate the functions of phospholipids.
26. How are lipids classified?
27. Give the structure and site of synthesis of adrenaline and noradrenaline.
28. Give the structure and properties of cellulose
29. Discuss about the reduction tests of sugars.
30. What are epimers? Give the structure of epimers of glucose
31. Why osazone of glucose, fructose and mannose are identical?

Section IV (Long Essay) Answer any two questions **(15 x 2= 30)**

32. Give an account of steroid hormones and its mechanism of action.
33. Describes the primary, secondary and tertiary structure of proteins.
34. Write on classification of lipids.
35. Explain Watson and Crick model of DNA.

Sree Narayana College, Kollam

Model Exam July 2018-Semester-IV, Botany and Zoology

Complementary course BC 1431-Intermediary Metabolism

Time: 3 hours **Maximum Marks: 80**

Section I (Very Short Answer maximum 2 sentences)

(Answer all questions) **(10x1=10marks)**

1. Write down the rate limiting steps of glycolysis
2. What is Wobble hypothesis?
3. Write on limit dextrin
4. Name two essential fatty acids?
5. Where do you find codon and anticodon.
6. Name the site at which the following occurs: Gluconeogenesis, citric acid cycle?
7. What is glycogenin?
8. Name primary and secondary bile acids.
9. What is omega oxidation?
10. What are okazaki fragments?

Section –II (Short Answer Questions-not to exceed one paragraph)

Answer any eight questions **(8 x 2=16)**

11. What are the key enzymes of gluconeogenesis?
12. Give two functions of phospholipids.
13. What is the role of lactate dehydrogenase in carbohydrate metabolism?
14. What is transamination reaction? Give two examples?
15. What is shine dalgarno sequence and anti-shine dalgarno sequence?
16. What are endopeptidases? Give two examples.
17. Give an account of codon-anticodon recognition.
18. Define genetic code. Discuss its salient features.
19. What is activation of fatty acids?
20. How bile acids acids are formed?
21. What are nucleosomes?
22. Write note on ribosomes.

Section –III (Short Essay- not to exceed 120 words)

Answer any six questions **(6 x4=24marks)**

23. Discuss about oxidative and non oxidative deamination of amino acids.
24. Describe cori's cycle and its significance
25. How is ammonia detoxified in the body?
26. Discuss about the digestion and absorption of lipids.
27. Explain the digestion and absorption of carbohydrates
28. Give an account of glycogenesis
29. Sketch the structure of tRNA
30. Give an account of glutathione cycle.
31. What are ketone bodies? How are they formed?

Section-IV (Long Essay) Answer any two questions **(15 x 2=30 marks)**

32. Explain Glycolysis
33. Describe in detail the process of prokaryotic transcription.
34. Illustrate scheme of β-oxidation and ATP yield of one mole of stearic acid.
35. Give an account of the reactions of HMP shunt pathway.

Sree Narayana College, Kollam

Model Exam November 2019-Semester-I, Botany and Zoology

Complementary course BC 1131-Biophysical Chemistry

Time: 3hours **Maximum Marks: 80**

Section I (Very Short Answer maximum 2 sentences)

(Answer all questions) **(7x1=7marks)**

1. Define Molarity
2. Define an acid and a base according to Arrhenius concept.
3. What is the principle of chromatography?
4. What is osmotic pressure
5. What is molar extinction coefficient?
6. What is Tyndall effect?
7. What is colligative property?

Section-II (Short Answer Questions-not to exceed one paragraph)

Answer any eight questions **(6x 2 = 12 marks)**

8. Define Normality. How will you prepare a 2 N solution of NaOH (MW-40)?
9. Write the principle of gel filtration chromatography.
10. What is 2-Dimensional gel electrophoresis?
11. Illustrate the formation of a peptide bond
12. Distinguish between true solution and colloidal solution
13. Give the biological application of radioactive isotopes
14. Write about isoelectric focussing
15. What is the significance of glycosidic linkage?
16. Explain spectrophotometry.

Section-III (Short Essay-not to exceed 120 words)

Answer any six questions **(4x 4 = 16 marks)**

17. Discuss about ion product of water
18. List the differences between a lyophobic and lyophilic colloid
19. Illustrate β-N-glycosidic linkage.
20. Write about differential centrifugation
21. Explain the technique of affinity chromatography.
22. Explain Donnan Membrane equilibrium and its biological significance?

Section-IV (Long Essay)

Answer any one question **(1 x 15=15 marks)**

23. Discuss ion exchange chromatography as a technique for the separation of macromolecules
24. Explain the intra and intermolecular interactions in biological system

Sree Narayana College, Kollam

Model question, March 2019 -Semester II, Zoology/Botany Main; Course Code-BC1231

Complementary Course-Biochemistry- Biomolecules

Section I (Very Short Answer Type-max two sentences)Answer all questions (10x1=10)

1. Give the site of synthesis of TSH
2. Name two sulphur containing amino acids.
3. What are epimers? Give the epimers of glucose
4. Write about Moilsch's test
5. What is acrolein test?
6. What are zwitter ions
7. What are the bonds present in DNA
8. What is protein denaturation. Name two denaturing agents.
9. What are the different types of hormones. Give examples
10. Write any two steroid hormones.

Section II (Short Answer Questions-Not to exceed one para) Answer any eight questions (8x2=16)

11. What are purines and pyrimidines
12. Give and account of phospholipids. Give examples
13. Discuss thyroid hormones
14. Give the linear and cyclic structure of glucose
15. Distinguish between saponification number and iodine number
16. Give the structure of cholesterol.
17. What is a reducing sugar? Give two examples
18. What are essential fatty acids?
19. What is RM value?
20. Give the structure of RNA
21. Give any two chemical reactions of steroids
22. Give the structure of ATP

Section III (Short essay-not to exceed 120 words) Answer any six questions) (6 x 4= 24)

23. How the secondary structure of protein is stabilized by different types of bonds?
24. Physiological functions of phospholipids
25. Acid base properties of amino acids
26. Mechanism of action of steroid hormones
27. What are sphingolipids? Give examples
28. Give the structure of adrenaline and noradrenaline.
29. What are epimers. Give examples.
30. Write down the structure of pyrimidine bases in RNA.
31. Illustrate the formation of peptide bond.

Section IV (Long Essay) Answer any two questions (15 x 2= 30)

32. Classification of lipids, structure and function of various classes
33. Give an account of female and male sex hormones with structures
34. Classification of amino acids with structure
35. Explain the structural features of DNA

Jan Sree Narayana College, Kollam

Model Exam ~~October~~ 2019-Semester-III, Botany and Zoology

Complementary course BC 1331 Enzymes and Bioenergetics

Time: 3hours Maximum Marks: 80

Section I (Very Short Answer Type- maximum 2 sentences)

(Answer all questions) (10x1=10 marks)

1. What are coenzymes? give examples
2. What are high energy compounds? Give 2 examples
3. Write about the deficiency disease of Vit C
4. What do you mean by redox couple?
5. Define vitamins, Give examples.
6. Give michaelis menton equation
7. Name the inhibitors of site III of ETC.
8. What is anti egg white injury factor?
9. Example for competitive inhibition
10. Significance of Km value.

Section-II

(Short Answer Questions-not to exceed one paragraph)

Answer any eight questions (8 x 2 = 16 marks)

11. Role of hydrogen sulphide in ETC.
12. Explain L-B plot.
13. What is the significance of nitrogenase enzyme
14. Name two uncoupling agents of electron transport chain. How do they act?
15. What is meant by P/O ratio? Mention its significance in respiration?
16. Give the functions and sources of vitamin E.
17. Discuss about ATP synthase
18. Discuss about the various respiratory chain inhibitors
19. What is ΔG and its significance
20. What is meant by redox potential?
21. What are ubiquinones
22. Explain chemiosmotic hypothesis

Section-III

(Short Essay-not to exceed 120 words)

Answer any six questions (6 x 4 = 24 marks)

23. Write about enzyme specificity
24. Deficiency dieases of Vit B
25. List the electron carriers in mitochondrial electron transport
26. Differentiate oxidative and substrate level phosphorylation
27. Detail the factors affecting enzyme activity
28. Explain the mechanism of nitrogen fixation
29. Write about any one high energy compound.
30. Explain competitive inhibition
31. Give a note on enzyme purification

Section-IV (Long Essay)

Answer any two questions (15 x 2 =30 marks)

32. Discuss on water soluble vitamins with special reference to coenzymes.
33. Explain mitochondrial electron transport
34. Elaborate the sources, functions and deficiency diseases of fat soluble vitamins
35. Classification of enzymes

SREE NARAYANA COLLEGE, KOLLAM

Semester II, B Sc Zoology/Botany Main; Model Examination Nov 2020

Complementary Course-Biochemistry- Biomolecules

Course Code-BC1231 Max Mark -30

Time-1 hour

Section A

(Answer all questions. Each question carries 1mark)

1. Write about chargaff's rule.
2. What are zwitter ions?
3. What are the bonds present in DNA?

(3x1=3 marks)

Section B

(Answer any two questions. Each question carries 2 marks)

4. Give the structure of adrenaline and noradrenaline
5 Distinguish between saponification number and iodine number
6 Explain Molisch's test.
7 What are essential fatty acids?
8 What are the different purine and pyrimidine bases?
9 Give the structure of glucose.

(2 x 2= 4 Marks)

Section C

(Answer any two questions. Each question carries 4 marks)

10 Color reactions of carbohydrates
11. What are phospholipids? Enumerate the functions of phospholipids.
12 How are amino acid classified?
13 Give the structure and site of synthesis of T3 and T4.
14 Explain mutarotation.

(2 x 4= 8 marks)

Section D

(Answer any one question . Each question carries 15 marks)

23. Explain the structural features of DNA
25. Classification of lipids
26. Give an account of steroid hormones.

(15 x 1=15 marks)

Sree Narayana College, Kollam

Model Exam Feb 2020-Semester-IV, Botany and Zoology

Complementary course BC 1431-Intermediary Metabolism

Time: 3 hours **Maximum Marks: 80**

Section I (Very Short Answer maximum 2 sentences)

(Answer all questions) **(10x1=10marks)**

1. How many ATP molecules are used in glycolysis?
2. What is Wobble hypothesis?
3. What are okazaki fragments?
4. Name two nonsense codons.
5. Which are the essential fatty acids?
6. What is the function of sigma factor
7. Name the site at which the following occurs: Glycolysis, gluconeogenesis,?
8. Which are the key gluconeogenic enzymes.
9. Name primary and secondary bile acids.
10. What is omega oxidation?

Section –II (Short Answer Questions-not to exceed one paragraph)

Answer any eight questions **(8 x 2=16)**

11. What are ketone bodies? How are they formed?
12. What is oxidative deamination? Give example?
13. What is limit dextrin?
14. Draw the structure of tRNA.
15. What are endopeptidases? Give examples
16. Give an account of codon-anticodon recognition.
17. Define genetic code.
18. How glucose is activated in glycogenesis
19. Explain termination of prokaryotic transcription
20. Write a note on the fate of pyruvate formed during glycolysis.
21. Describe cori's cycle and its significance
22. Briefly explain the salient features of DNA double helix.

Section –III (Short Essay- not to exceed 120 words)

Answer any six questions **(6 x4=24marks)**

23. Give an account of the zymogen activation of proteolytic enzymes of GI tract
24. Briefly explain the absorption of amino acids in the GI tract.
25. Outline the steps in urea cycle.
26. What are the physiological functions of phospholipids?
27. How is ammonia detoxified in the body?
28. Calculate the ATP yield upon the complete oxidation of palmitic acid with steps involved.
29. Give the significance of citric acid cycle.
30. Give an account of the irreversible steps of glycolysis.
31. Explain glycogen sysnthesis

Section-IV (Long Essay)

Answer any two questions **(15 x 2=30 marks)**

32. Describe the cytoplasmic system of fatty acid biosynthesis and its regulation.
33. Describe in detail the process of prokaryotic protein biosynthesis.
34. Detail HMP pathway and its significance
35. Explain digestion and absorption of carbohydrates.

SREE NARAYANA COLLEGE, KOLLAM

Semester III, B Sc Zoology/Botany Main; Model Examination Feb 2021

Complementary Course-Biochemistry- Enzymes and Bioenergetics

Course Code-BC1331 Max Mark -40

Time-1 1/2 hour

Section A

(Answer all questions. Each question carries 1mark)

1. Which are the organelles involved in photorespiration
2. Name fat soluble vitamins.
3. Give any two examples of coenzymes
4. Chemical name Vit E
5. What is nitrogenase complex?

(5x1=5 marks)

Section B

(Answer any four questions. Each question carries 2 marks)

6. What are high energy compounds
7. What are the features of Km value
8. What are marker enzymes?
9. Name the various ATP site in the respiratory chain
10. Give note on redox potential
11. What is meant by P/O ratio? Mention its significance in respiration? (4 x 2= 8 Marks)

Section C

(Answer any three questions. Each question carries 4 marks)

12. Deficiency diseases of Vit A
13. What are the factors influencing enzyme activity?
14. State the uncouplers of oxidative phosphorylation
15. Elaborate on cyclic photophosphorylation.
16. Explain allosteric regulation

(3x 4= 12 marks)

Section D

(Answer any one question . Each question carries 15 marks)

17. Explain C 4 pathway
18. Elaborate on different types of enzymes inhibitions with examples
19. Give an account of electron transport chain.

(15 x 1=15 marks)

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Model Exam March 2021-Semester-I, Botany and Zoology

Complementary course BC 1131-Biophysical Chemistry

Time: 3hours **Maximum Marks: 80**

Section I (Very Short Answer maximum 2 sentences)

(Answer all questions) **(10x1=10marks)**

1. Define Molality
2. Define an acid and a base according to Arrhenius concept.
3. What is the principle of chromatography?
4. What is molar extinction coefficient?
5. What is Tyndall effect?
6. What is colligative property?
7. Define diffusion
8. What is a buffer? Give two examples
9. What is osmotic pressure
10. What are the three bonds present in DNA?

Section-II (Short Answer Questions-not to exceed one paragraph)

Answer any eight questions **(8x 2 = 16 marks)**

11 State Beer – Lambert's Law and its application.
12 What are emulsions and emulsifying agents?
13 Define Normality. How will you prepare a 4 N solution of NaOH (MW-40)?
14 Write the principle of gel filtration chromatography.
15 Illustrate the formation of a peptide bond
16 Distinguish between true solution and colloidal solution
17 Write about isoelectric focussing
18 What is the significance of glycosidic linkage?
19 If a solution has a pH of 6 at 25 °C. Calculate its [OH^-].
20 Explain spectrophotometry.
21 Illustrate disulphide bonds
22 What is meant by hypertonic and hypotonic solution?

Section-III (Short Essay-not to exceed 120 words)

Answer any six questions **(6 x 4 = 24 marks)**

23 Discuss about ion product of water
24 List the differences between a lyophobic and lyophilic colloid
25 Explain thin layer chromatography
26 Illustrate β-N-glycosidic linkage.
27 Write about differential centrifugation
28 Explain the technique of affinity chromatography.
29 Discuss on Vant Hoff's law.
30 Elaborate on isomerism, classification with examples.
31 Derive the Handerson Hassel Balch equation.

Section-IV (Long Essay)

Answer any two questions **(15 x 2 =30 marks)**

31. Explain the parts of spectrophotometer with diagram
32 Discuss ion exchange chromatography as a technique for the separation of macromolecules
34. Explain the intra and intermolecular interactions in biological system
35. Explain Donnan Membrane equilibrium and its biological significance?

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Model Exam June 2021-Semester-IV, Botany and Zoology

Complementary course BC 1431-Intermediary Metabolism

Time: 1 ½ hrs **Maximum Marks: 40**

Section I (Very Short Answer maximum 2 sentences)

(Answer 5 questions)

(5x1=5marks)

1. Give the site of glycolysis
2. Write on limit dextrin
3. Name two essential fatty acids?
4. Where do you find codon and anticodon.
5. Name the site at which the following occurs: Gluconeogenesis, citric acid cycle?
6. What is glycogenin?
7. What are okazaki fragments?
8. Which is the key enzyme of HMP shunt pathway?
9. Name calcium binding protein.
10. What are histones?

Section –II (Short Answer Questions-not to exceed one paragraph)

Answer any four questions **(4 x 2=8)**

11.What are the key enzymes of gluconeogenesis?
12.What is transamination reaction? Give two examples?
13.What are nucleosomes?
14.What is alpha oxidation?
15.What are phospholipids? Give one example.
16. What are lipases
17. What are essential fatty acids and their functions
18. Describe DNA fibril.
19. Give the significance of citric acid cycle.
20 Give an account of the irreversible steps of glycolysis
21 Explain glycogen sysnthesis
22 Discuss hormonal regulation of glycogen metabolism
23 Give the features of mRNA?
24. Central dogma of life, illustrate.
25 What are nucleosomes?
26 Give the function of rRNA

Section –III (Short Essay- not to exceed 120 words)

(3 x4=12marks) **Answer any three questions**

27.How bile acids are synthesized?
28.Describe cori's cycle and its significance
29.Explain the digestion and absorption of carbohydrates
30.Give an account of glycogen synthesis.
31. Sketch the structure of tRNA
32.Explain ketone body formation.
33.Explain triglyceride synthesis.
34.Give the physiological functions of phospholipids.
35.How glucose is activated in glycogenesis

Section-IV (Long Essay)Answer any one questions

(15 x 1=15marks)

36.Explain Glycolysis
37.Give an account of the reactions of HMP shunt pathway.
38.Outline the biosynthesis of cholesterol
39.Explain the denovo synthesis of fatty acid and its regulation
40.Detail citric acid cycle

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Test paper, Dec 2021-Semester-I, Botany and Zoology
Complementary course BC 1131-Biophysical Chemistry

Time: 1 hour **Maximum Marks: 30**

(Long Essay)

Answer any three questions **(10 x 3 =30 marks)**

1. Discuss ion exchange chromatography as a technique for the separation of macromolecules
2. Explain the intra and intermolecular interactions in biological system
3. Elaborate on isomerism, classification with examples.
4. What are the different methods for expressing the concentration of a solution
5. Explain thin layer chromatography

Sree Narayana College, Kollam
Test paper, Dec 2021-Semester-I, Botany and Zoology
Complementary course BC 1131-Biophysical Chemistry

Time: 1 hour **Maximum Marks: 30**

(Long Essay)

Answer any three questions **(10 x 3 =30 marks)**

1. Discuss ion exchange chromatography as a technique for the separation of macromolecules
2. Explain the intra and intermolecular interactions in biological system
3. Elaborate on isomerism, classification with examples.
4. What are the different methods for expressing the concentration of a solution
5. Explain thin layer chromatography

Sree Narayana College, Kollam
Test paper, Dec 2021-Semester-I, Botany and Zoology
Complementary course BC 1131-Biophysical Chemistry

Time: 1 hour **Maximum Marks: 30**

(Long Essay)

Answer any three questions **(10 x 3 =30 marks)**

1. Discuss ion exchange chromatography as a technique for the separation of macromolecules
2. Explain the intra and intermolecular interactions in biological system
3. Elaborate on isomerism, classification with examples.
4. What are the different methods for expressing the concentration of a solution
5. Explain thin layer chromatography

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Model question, December 2021-Semester II, Zoology/Botany Main; Course Code-BC1231

Complementary Course-Biochemistry- Biomolecules

Section I (Very Short Answer Type-max 2 sentences) Answer all questions **(10x1=10)**

1. Give the site of synthesis of TSH
2. What are zwitter ions?
3. What are the bonds present in DNA?
4. Give the structure of Adenine
5. How many peptide bonds are present in a tripeptide?
6. Illustrate peptide bond.
7. What is the difference between fat and oil?
8. What is chargaff's rule?
9. Explain acrolein test
10. Write about zak's test

Section II (Short Answer Questions-Not to exceed one para) Answer any eight questions **(8x2=16)**

11. Give the structure of adrenaline and noradrenaline
12. Give the differences between DNA and RNA
13. Distinguish between saponification number and iodine number
14. Give the structure of cholesterol.
15. Distinguish between cAMP and cGMP.
16. What are essential fatty acids?
17. What is RM value?
18. Give any two chemical reactions for reducing sugars
19. What are the different purine and pyrimidine bases?
20. Glucose , fructose and mannose will form identical osazones. Why?
21. Give the structure of tRNA
22. Give the Haworth projection formula of glucose and fructose

Section III (Short essay-not to exceed 120 words) Answer any six questions) **(6 x 4= 24)**

23. Give an account of steroid hormones.
24. Write on dehydration and osazone formation of monosachharides
25. How are lipids classified?
26. Give the structure and site of synthesis of T3 and T4.
27. Give the structure and properties of maltose
28. Discuss the determination of N terminal amino acid and C-terminal amino acid
29. What are epimers? Give the structure of epimers of glucose
30. Mechanism of action of steroid hormones
31. Write on the color reactions of carbohydrates.

Section IV (Long Essay) Answer any two questions **(15 x 2= 30)**

32. Describes the primary, secondary and tertiary structure of proteins.
33. Explain the structural features of DNA
34. Illustrate the structure and biological functions of different types of RNA's
35. Elaborate the structure and function of phospholipids

Sree Narayana College, Kollam
Model Exam March 2022-Semester-I, Botany and Zoology
Complementary course BC 1131-Biophysical Chemistry

Time: 3 hours **Maximum Marks: 8A0**

Section I (Very Short Answer maximum 2 sentences)
(Answer all questions) **(10x1=10 marks)**

1. pH of a solution is 6. Find out the pOH of the solution.
2. Define an acid and a base according to Arrhenius concept.
3. What is colligative property?
4. Define hypotonic and hypertonic solution
5. What is tyndall effect?
6. Define buffer with example
7. Give the principle of chromatography
8. What is the principle of gel filtration?
9. How are covalent bonds formed?
10. Name the thin layer materials used in TLC

Section-II (Short Answer Questions-not to exceed one paragraph)
Answer any eight questions **(8x 2 = 16marks)**

11 What are emulsions and emulsifying agents? Which is the emulsifying agent in milk?
12 Define molarity. How will you prepare 2 M solution of NaOH (MW-40)?
13 Illustrate the formation of a peptide bond
14 Distinguish between true solution and colloidal solution
15 State Beer – Lambert's Law and its application
16 What are the functions of SH group?
17 Differentiate between osmosis and diffusion.
18 Write the application of density gradient centrifugation.
19 Differentiate lyophobic and lyophilic colloids
20 How will you prepare 1M solution of a solute?
21 Applications of two dimensional electrophoresis
22 Illustrate glycosidic bond

Section-III (Short Essay-not to exceed 120 words)
Answer any six questions **(6 x 4 = 24 marks)**

23 Discuss Vant -Hoff's law of osmotic pressure and its application.
24 Explain thin layer chromatography
25 Give a short note on stereoisomerism?
26 Explain the technique of affinity chromatography.
27 Discuss about the common functional groups present in biomolecules?
28 Give an account on the classification of isomers?
29 Explain the significance of functional groups in biomolecules.
30 Discuss about ion product of water
31 Brief covalent interactions in biological system

Section-IV (Long Essay)
Answer any two questions **(15 x 2 =30 marks)**

32 Detailed note on isomerism
33 Explain Handerson Hasselbalch equation and its significance
34 Explain Donnan membrane equilibrium and its biological significance.
35. Describe the different methods of expressing the concentration of solution

Sree Narayana College, Kollam
Model Exam Mar 2022-Semester-III, Botany and Zoology
Complementary course BC 1331 Enzymes and Bioenergetics

Time: 1.5 hours Maximum Marks: 40

Section I (Very Short Answer Type- maximum 2 sentences)
(Answer all questions) (5x1=5marks)

1. What do you mean by redox couple?
2. Define vitamins, Give examples.
3. Name the inhibitors of site III of ETC.
4. Example for competitive inhibition
5. Significance of Km value.

Section-II
(Short Answer Questions-not to exceed one paragraph)
Answer any four questions (4 x 2 = 8 marks)

6. Role of hydrogen sulphide in ETC.
7. Explain L-B plot.
8. Write about Molisch's test
9. Name two uncoupling agents of electron transport chain. How do they act?
10. What is meant by P/O ratio? Mention its significance in respiration?
11. Write Micheal Menton equation

Section-III
(Short Essay-not to exceed 120 words)
Answer any three questions (3 x 4 = 12 marks)

12. Write about enzyme specificity
13. List the electron carriers in mitochondrial electron transport
14. Differentiate oxidative and substrate level phosphorylation
15. Detail the factors affecting enzyme activity
16. Write about any one high energy compound.
17. Explain photosynthetic unit

Section-IV (Long Essay)
Answer any one question (15 x 1 =15 marks)

18. Explain mitochondrial electron transport
19. Give an account of inhibition of enzymes.
20. Classification of enzymes