

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2022

Biochemistry

BCH 4C 04—BIOCHEMISTRY—IV

(2020 Admissions)

Time : Two Hours

Maximum : 60 Marks

Section A

*Answer all questions.
Each question carries 1 mark.*

- Which is not a peptide hormone ?
 - Insulin.
 - Oxytocin.
 - Glucagon.
 - Adrenaline
- Digestion of lipids begins in the _____
 - Esophagus.
 - Mouth.
 - Small intestine.
 - Liver.
- Cori cycle takes place in the _____.
- Kornberg enzyme is _____.
 - DNA Polymerase I.
 - RNA polymerase.
 - DNA Polymerase II.
 - DNA Polymerase III.
- Name the site of fatty acid oxidation.
- _____ is an example of both glucogenic and ketogenic amino acid.
 - Alanine.
 - Isoleucine.
 - Lysine.
 - Arginine.

Turn over

7. Okazaki fragments can be seen on the _____.
- (a) Promoter region. (b) lagging strand.
(c) Terminator region. (d) Leading strand.
8. The site of biosynthesis of the hormone glucagon is _____.
- (a) Beta cells of pancreas. (b) Pituitary gland.
(c) Adrenal gland. (d) Alpha cells of pancreas.
9. Name the three stop codons in genetic code.

(9 × 1 = 9 marks)

Section B

Answer atleast six questions.

Each question carries 3 marks.

All questions can be attended.

Overall Ceiling 18.

10. State the role of HMG-CoA reductase in cholesterol biosynthesis.
11. What is urea cycle ? Mention its importance.
12. Define (a) Ori C ; and (b) Replication fork.
13. Write note on hormones of adrenal gland.
14. How amino acids are activated during translation ?
15. Write about the transamination reaction of amino acids. Give example.
16. What is β -oxidation and its significance ?
17. Give an account of the functions of thyroid gland hormones ?

(6 × 3 = 18 marks)

Section C

Answer atleast three questions.

Each question carries 7 marks.

All questions can be attended.

Overall Ceiling 21.

18. Briefly explain the steps involved in the transcription process of prokaryotes.
19. Explain Cori cycle.

20. Outline the reactions involved in fatty acid biosynthesis.
21. How are hormones classified based on their mechanism of action ?
22. Briefly describe different types of RNA and their functions.

(3 × 7 = 21 marks)

Section D

*Answer any **one** question.
The question carries 12 marks.*

23. Explain translation in prokaryotes.
24. Elaborate on digestion and absorption of lipids.

(1 × 12 = 12 marks)

CHMK LIBRARY UNIVERSITY OF CALICUT

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2022

Biochemistry

BCH 4B 07—INTERMEDIARY METABOLISM—I

(2020 Admissions)

Time : Two Hours

Maximum : 60 Marks

Section A

*Answer at least **eight** questions.*

Each question carries 3 marks.

All questions can be attended.

Overall Ceiling 24.

1. List out the precursors of gluconeogenesis.
2. List out two differences between anabolism and catabolism.
3. Why do proteins get ubiquitinated ?
4. Differentiate between aerobic and anaerobic glycolysis.
5. Name the kinases involved in glycolysis.
6. Why are metabolic pathways comprised of sequential reactions instead of a single step ?
7. Define Proteasome.
8. Explain the use of metabolic inhibitors to study metabolism citing an example.
9. Name two proteases involved in protein digestion.
10. How many ATPs are formed during anerobic glycolysis ?
11. Cite two examples of radioactive isotopes to study metabolism.
12. Compare lysosome and proteasome.

(8 × 3 = 24 marks)

Turn over

Section B

*Answer at least **five** questions.*

Each question carries 5 marks.

All questions can be attended.

Overall Ceiling 25.

13. How does galactose enter glycolytic pathway ?
14. Brief on the reciprocal regulation of glycolysis and gluconeogenesis.
15. How are metabolic pathways compartmentalized in a cell ?
16. Discuss the degradation of starch.
17. Describe the ubiquitin mediated proteolytic pathway.
18. Explain with example how transgenic animal is used to study metabolism.
19. Illustrate oxidative phase of HMP pathway.

(5 × 5 = 25 marks)

Section C

*Answer any **one** question.*

The question carries 11 marks.

20. Describe the study of metabolism using bacterial mutants.
21. Detail on the steps involved in glycogenolysis.

(1 × 11 = 11 marks)

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION, APRIL 2022

Biochemistry

BCH 4B 06—ENZYMOLGY

(2020 Admission onwards)

Time : Two Hours

Maximum : 60 Marks

Section A

*Answer atleast eight questions.**Each question carries 3 marks.**All questions can be attended.**Overall ceiling 24.*

1. What do you mean by induced fit model ?
2. What is a multi-enzyme complex ? Give an example.
3. Define Kcat. What is its significance ?
4. Write the structure of NADP.
5. Give the mechanism of action of penicillin.
6. Illustrate the significance of isoenzymes.
7. Define salting out.
8. What do you know about abzymes ?
9. Write the principle and applications of isoelectric focusing.
10. List the various factors affecting enzyme kinetics.
11. Write on detergent enzymes.
12. Write any four industrial uses of enzymes.

(8 × 3 = 24 marks)

Turn over

Section B

Answer atleast five questions.

Each question carries 5 marks.

All questions can be attended.

Overall ceiling 25.

13. Write the Michaelis-Menten equation, clearly explaining the terms involved.
14. Write briefly on the salient features of the active site.
15. Discuss Lineweaver-Burk plot and its significance.
16. Give the importance of phosphorylation in the regulation of enzyme activity.
17. List the various applications of immobilised enzymes.
18. Describe the process of ultracentrifugation and its significance in enzymology.
19. Mention the salient features of allosteric enzymes. How is their kinetics different ?

(5 × 5 = 25 marks)

Section C

Answer any one question.

The question carries 11 marks.

20. Elaborate on the procedure of PAGE and its application in enzymology.
21. Discuss briefly the various types of enzyme inhibition.

(1 × 11 = 11 marks)

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION, APRIL 2022

Biochemistry

BCH 4C 04—BIOCHEMISTRY—IV

(2019 Admission onwards)

Time : Two Hours

Maximum : 60 Marks

Section A

*Answer all questions.**Each question carries 1 mark.*

- How many NADH, H⁺ are produced during β -oxidation of palmitic acid ?
 - 7.
 - 8.
 - 14.
 - 15.
- Committed enzyme for fatty acid biosynthesis is :
 - HMG Co A reductase.
 - Acetyl CoA dehydrogenase.
 - Acetyl CoA carboxylase.
 - Malonyl CoA carboxylase.
- In transamination reaction after accepting amino group from all amino acids, α -KG is converted to _____.
 - Oxaloacetate.
 - Aspartic acid.
 - Glutamate.
 - Pyruvate.
- Glutamate is decarboxylated to _____.
 - Glycine.
 - GABA.
 - Histamine.
 - Dopamine.
- Which of the following enzyme in E coli posses 5'- 3' exonuclease activity ?
 - DNA polymerase I.
 - DNA polymerase II.
 - DNA polymerase III.
 - RNA polymerase I.

Turn over

6. Length of Okazaki fragments is :
- a) 100-200 nucleotides.
 - b) 200-400 nucleotides.
 - c) 1000-2000 nucleotides.
 - d) None of the above.
7. Transcription termination protein in *E. coli* is :
- a) Sigma.
 - b) Rho.
 - c) Alpha.
 - d) Beta.
8. _____ is the enzyme used to synthesize urea from arginine.
9. In Cori's cycle, lactate produced in muscle is delivered to _____ to synthesize glucose.
- (9 × 1 = 9 marks)

Section B

*Answer atleast six questions.
Each question carries 3 marks.
All questions can be attended.
Overall ceiling 18.*

- 10. Give three characteristics of genetic code.
- 11. Mention the major physiological functions of thyroxine.
- 12. List out stop codons.
- 13. Explain the role of different RNA in protein synthesis.
- 14. What is Ori C ? Give its features.
- 15. Write briefly on absorption of lipids.
- 16. Discuss on promoters in *E. coli*.
- 17. Write a short notes on replication fork in replication.

(6 × 3 = 18 marks)

Section C

*Answer atleast three questions.
Each question carries 7 marks.
All questions can be attended.
Overall ceiling 21.*

- 18. Explain the steps in Urea cycle.
- 19. How is acetyl groups transferred from mitochondria to the cytosol for fatty acid synthesis ?

20. Mention the site of biosynthesis of glucocorticoids and also give its physiological role.
21. Write a briefly on termination process in transcription.
22. Discuss on fatty acid synthase complex.

(3 × 7 = 21 marks)

Section D

*Answer any one question.
Each question carries 12 marks.*

23. Give an account of DNA replication process in *E. coli*.
24. Elaborate on the various steps in β oxidation of fatty acids and calculate the number of ATP produced after the complete oxidation of palmitic acid to CO_2 .

(1 × 12 = 12 marks)

CHMK LIBRARY UNIVERSITY OF CALICUT

FOURTH SEMESTER (CBCSS—UG) EXAMINATION, APRIL 2022

Biochemistry

BCH4B07—INTERMEDIARY METABOLISM—II

(2019 Admission onwards)

Time : Two Hours

Maximum : 60 Marks

Section A*Answer atleast eight questions.**Each question carries 3 marks.**All questions can be attended.**Overall ceiling 24.*

1. Name any two groups of proteolytic enzymes involved in protein turnover.
2. Why is Calvin cycle called C3 pathway ?
3. Write the reaction catalyzed by PRPP synthetase.
4. Give the structure of β -carotene.
5. Why is photorespiration called a wasteful process ?
6. Give the transamination reaction of valine.
7. Comment on the metabolic fate of phenylalanine. Justify your answer.
8. Mention the sources of atoms in pyrimidine ring.
9. Mention two differences between carbamoyl phosphate synthetase I and II.-
10. How is uridine triphosphate converted to cytidine triphosphate ?
11. Using a diagram, indicate the site of light and dark reaction in chloroplast.
12. State the decarboxylation reaction of glutamate.

(8 × 3 = 24 marks)

Turn over

Section B

Answer atleast five questions.

Each question carries 5 marks.

All questions can be attended.

Overall ceiling 25.

13. Give the steps involved in conversion of tyrosine to melanin.
14. Write the steps involved in the degradation of AMP.
15. How is glycine synthesized ?
16. Give a brief overview of photophosphorylation during light reaction.
17. Write short note on transamination reaction citing examples.
18. How is Ribulose-1, 5-bisphosphate regenerated from triose phosphates ?
19. Comment on the salvage pathway of purine synthesis.

(5 × 5 = 25 marks)

Section C

Answer any one question.

Each question carries 11 marks.

20. Describe the steps involved in conversion of ammonia to urea.
21. Detail the pathway of electron flow from H₂O to NAPD⁺ through Z scheme.

(1 × 11 = 11 marks)

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION, APRIL 2022

Biochemistry

BCH 4B 06—INTERMEDIARY METABOLISM—I

Time : Two Hours

Maximum : 60 Marks

Section A

*Answer at least **eight** questions.*

Each question carries 3 marks.

All questions can be attended.

Overall Ceiling 24.

1. Diagrammatically represent the structure of mitochondria.
2. Why is pyruvate converted to lactate ?
3. What is meant by amphibolic nature of TCA cycle ?
4. Body cannot synthesize linoleate and linolenate. Give reason.
5. Name one inhibitor of each complex in electron transport chain.
6. Name any *four* biological molecules whose synthesis starts from cholesterol.
7. Name the enzymes unique to gluconeogenesis.
8. Write about the structure of ATP synthase.
9. Define oxidative decarboxylation with a suitable example.
10. What is glycogenin ? What is its function ?
11. Give reason for the negative ΔG of hydrolysis of ATP.
12. Name any *four* tissues in which pentose phosphate pathway is prominent.

(8 × 3 = 24 marks)

Turn over

Section B

*Answer at least **five** questions.*

Each question carries 5 marks.

All questions can be attended.

Overall Ceiling 25.

13. Explain glycerol-3-phosphate shuttle and its significance.
14. Write a brief description about the different approaches used to study metabolism.
15. How is galactose metabolized ?
16. Write down the sequence of reactions involved in gluconeogenesis.
17. Explain the hormonal regulation of glycogen metabolism.
18. How are ketone bodies formed ?
19. Explain glyoxylate cycle.

(5 × 5 = 25 marks)

Section C

*Answer any **one** question.*

The question carries 11 marks.

20. Give a detailed account of the reactions, energetics and regulation of TCA cycle.
21. Discuss in detail the cytoplasmic system of fatty acid biosynthesis.

(1 × 11 = 11 marks)

**FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2022**

Biochemistry

BCH4C04—BIOCHEMISTRY IV

(2014—2018 Admissions)

Time : Three Hours

Maximum : 64 Marks

Section A

Answer all questions.

Each question carries 1 mark.

1. The hormone epinephrine is synthesized by _____.
 - (a) Pancreas.
 - (b) Hypothalamus.
 - (c) Adrenal gland.
 - (d) Pituitary.
2. Biosynthesis of fatty acids takes place in the _____.
 - (a) Mitochondria.
 - (b) Cytosol.
 - (c) Nucleus.
 - (d) Lysosomes.
3. _____ is the best source of biotin.
 - (a) Oranges.
 - (b) Egg yolk.
 - (c) Potato.
 - (d) Onion.
4. Menkes disease is caused by the deficiency of _____.
 - (a) Iodine.
 - (b) Iron.
 - (c) Copper.
 - (d) Selenium
5. Identify a hormone having structural similarity with cholesterol.
 - (a) Glucagon.
 - (b) Epinephrine.
 - (c) Cortisol.
 - (d) Thyroxine.

Turn over

6. List out any *two* digestive enzymes of digestive tract.
7. Cholesterol biosynthesis begins with _____.
8. Name the disease associated with Vitamin C deficiency.
9. Give one example each for glucogenic and ketogenic amino acid.
10. Name the trace mineral necessary for scavenging of peroxides.

(10 × 1 = 10 marks)

Section B

*Answer any seven questions.
Each question carries 2 marks.*

11. What are trace minerals ? Give two examples.
12. What is fatty acid synthase complex ?
13. How is the zymogen form of trypsin activated ?
14. Comment on transamination reaction.
15. Write down the functions of glucocorticoids.
16. List out the water soluble vitamins.
17. What is the fate of ammonia in our body ?
18. Mention the site of biosynthesis of : (a) Growth hormone ; (b) Glucagon.
19. Give the biochemical functions of pyridoxine.
20. Which is the committed step in cholesterol biosynthesis ?

(7 × 2 = 14 marks)

Section C

*Answer any four questions.
Each question carries 5 marks.*

21. Write on the biosynthesis and degradation of glycine.
22. Give one biochemical reaction involving :
 - (a) Biotin.
 - (b) PLP.
 - (c) TPP.

23. Differentiate between glucogenic and ketogenic amino acids with examples.
24. How are hormones classified based on mechanism of action?
25. Give an account on the physiological function of phospholipids.
26. Briefly explain the importance of macro minerals with examples.

(4 × 5 = 20 marks)

Section D

Answer any two questions.

Each question carries 10 marks.

27. Describe the biological role and nutritional importance of any five trace minerals.
28. Elaborate on urea cycle.
29. Detail on β -oxidation of palmitic acid. Calculate the ATP yield in this process.
30. Detail on fat soluble vitamins, their physiological functions and daily requirement.

(2 × 10 = 20 marks)

**FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2022**

Biochemistry

BCH 4B 05—BIOMOLECULES AND BIOINFORMATICS

(2014—2018 Admissions)

Time : Three Hours

Maximum : 80 Marks

Section A

*Answer all questions.
Each question carries 1 mark.*

1. Name a heteropolysaccharide.
2. Name any one colour reaction of proteins.
3. An example of essential fatty acid is :
 - (a) Stearic acid.
 - (b) Oleic acid.
 - (c) Palmitic acid.
 - (d) Linolenic acid.
4. Stereoisomers that are mirror images of each other are called _____.
5. Denaturation cannot break the _____ structure of proteins.
 - (a) Secondary.
 - (b) Primary.
 - (c) Tertiary.
 - (d) Quaternary.
6. Z-DNA is a _____ handed double helix.
7. The most common symptom of vitamin D deficiency in young children is :
 - (a) Osteomalacia.
 - (b) Scurvy.
 - (c) Rickets.
 - (d) Hyperkeratosis.
8. PubMed is a _____ database.
9. Name the reactive group responsible for forming a blue-purple colored product in ninhydrin reaction.
10. Give an example for nucleotide sequence database.

Turn over

11. The macro mineral essential for blood coagulation is :
- (a) Calcium. (b) Magnesium.
(c) Phosphorous. (d) Sodium.
12. Name a homodisaccharide.
13. _____ is a α -imino acid.
- (a) Tryptophan. (b) Proline.
(c) Histidine. (d) Arginine.
14. The higher the _____ content of α -DNA, the higher is its melting temperature or T_m .
15. Uridine is a _____.
- (a) Nucleotide. (b) Nucleoside.
(c) Nitrogenous base. (d) Unusual base.
16. _____ are the most abundant phospholipids in cell membrane.

(16 \times 1 = 16 marks)

Section B

Answer any eight questions.

Each question carries 3 marks

17. What are fat soluble vitamins ? Give examples.
18. Enumerate the differences between DNA and RNA.
19. What are epimers ? Give examples.
20. Define acid number. Give its significance.
21. What do you understand by secondary databases ? Give examples.
22. Write the structure of sucrose and lactose.
23. What are steroids ? Give any *two* examples with structures.
24. How are proteins precipitated ?

25. What are essential amino acids ? Give four examples.
26. What is Cot curve? Mention its significance.

(8 × 3 = 24 marks)

Section C

*Answer any four questions.
Each question carries 5 marks.*

27. Discuss the secondary structure of tRNA.
28. General reactions of amino acids.
29. What are trace elements ? Mention their function and deficiency diseases.
30. Give an account of the forces influencing protein structure.
31. Detail the classification of monosaccharides. Give example and write its structure.
32. Write briefly on sequence alignment.

(4 × 5 = 20 marks)

Section D

*Answer any two questions.
Each question carries 10 marks.*

33. Explain the different levels of structural organization of proteins.
34. Detail the classification of lipids, general structure and function with examples.
35. What are macro minerals ? Describe their sources, functions and deficiency diseases.

(2 × 10 = 20 marks)

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION, APRIL 2021

Biochemistry

BCH 4C 04—BIOCHEMISTRY-IV

Time : Two Hours

Maximum : 60 Marks

Section A

*Answer all questions.**Each question carries 1 mark.*

- Which of the following molecule is able to cross the inner mitochondrial membrane ?
 - Acetyl CoA.
 - Fatty acyl - carnitine.
 - Fatty acyl CoA.
 - Malonyl CoA.
- The precursor for cholesterol biosynthesis is :
 - HMG CoA.
 - Acetyl CoA.
 - Acyl CoA.
 - Malonyl CoA.
- Which of the following is not a glucogenic amino acid ?
 - Lysine.
 - Aspartic acid.
 - Alanine.
 - Serine.
- Which of the following subunit of RNA polymerase helps to recognize the transcription start site in *E. coli* ?
 - α - subunit.
 - β - subunit.
 - β' - subunit.
 - σ - subunit.
- Name the hormone which promotes glycogen synthesis ?
 - Insulin.
 - Epinephrine.
 - Glucagon.
 - Growth hormone.
- Okazaki fragments are joined by :
 - Primase
 - Topoisomerase.
 - DNA polymerase
 - DNA ligase.
- _____ is the site of synthesis of insulin.
 - Pancreatic α - cell.
 - Pancreatic β -cell.
 - Pancreatic δ - cell.
 - None of the above.

Turn over

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION, APRIL 2021

Biochemistry

BCH 4B 07—INTERMEDIARY METABOLISM-II

Time : Two Hours

Maximum : 60 Marks

Section A*Answer at least **eight** questions.**Each question carries 3 marks.**All questions can be attended.**Overall Ceiling 24.*

1. How is nucleoside monophosphate converted to nucleoside triphosphate?
2. Comment on the regulation of purine biosynthesis.
3. Give the rate limiting reaction of urea cycle. What activates it?
4. State the function of accessory pigments. Give two examples.
5. Write the reaction converting adenine base to adenosine monophosphate.
6. Comment on the purpose of light reaction in photosynthesis.
7. Which hormones are produced by degradation of tryptophan?
8. How does ammonia enter into amino acids?
9. What is the reaction catalysed by ATCase?
10. Brief on the role of Cytochrome bf complex in light reaction.
11. State the reactions catalysed by xanthine oxidase enzyme.
12. Give structure of common starting molecules in synthesis of aromatic amino acids.

(8 × 3 = 24 marks)

Section B*Answer at least **five** questions.**Each question carries 5 marks.**All questions can be attended.**Overall Ceiling 25.*

13. Give the steps involved in the biosynthesis of UMP.
14. Phenylalanine is ketogenic. Justify by giving reactions of phenylalanine degradation.

Turn over

15. Briefly discuss oxidative and non-oxidative deamination of amino acids.
16. Write brief note on photorespiration.
17. How do tropical plants concentrate CO₂ ?
18. Briefly describe S-adenosyl methionine cycle.
19. Comment on cyclic photophosphorylation.

(5 × 5 = 25 marks)

Section C

*Answer any **one** question.
The question carries 11 marks.*

20. Detail the de novo synthesis of inosine mono phosphate.
21. Describe the steps involved in the synthesis of phenylalanine and tyrosine.

(1 × 11 = 11 marks)

**FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2021**

Biochemistry

BCH 4B 06—INTERMEDIARY METABOLISM—I

Time : Two Hours

Maximum : 60 Marks

Section A

*Answer at least **eight** questions.*

Each question carries 3 marks.

All questions can be attended.

Overall Ceiling 24.

1. Define free energy, enthalpy and entropy.
2. ATP is the energy' currency of the cell. Justify.
3. Why is hexokinase not considered as the rate limiting enzyme in glycolysis ?
4. What is β -oxidation? Name the location of β -oxidation.
5. Write the sequence of electron carries in electron transport chain.
6. Differentiate substrate level and oxidative phosphorylation.
7. Liver synthesizes ketone bodies, but cannot utilize it for energy requirements. Give reason.
8. How are fatty acids activated prior to their oxidation ?
9. What is the glyoxylate cycle ? Write its significance.
10. In the process of glycogenolysis write about the fate of glucose-6-P in liver and muscle.
11. What is carnitine? Write its significance.
12. Name a genetic defect in galactose metabolism and its cause.

(8 × 3 = 24 marks)

Turn over

Section B

*Answer at least **five** questions.*

Each question carries 5 marks.

All questions can be attended.

Overall Ceiling 25.

13. Explain the regulation of glycolysis.
14. Calculate the energy yield upon complete oxidation of one molecule of Palmitic acid.
15. Explain the process of ketogenesis.
16. Write the sequence of reactions in pentose phosphate pathway.
17. Explain the process of glycogenesis.
18. How are intact animals and radioactive isotopes made use in the study of metabolism ?
19. Write down the steps involved in the biosynthesis of fatty acid up to the elongation stage.

(5 × 5 = 25 marks)

Section C

*Answer any **one** question.*

The question carries 11 marks.

20. Give a detailed account of the reactions involved in the bio-synthesis of cholesterol.
21. Discuss in detail the process of gluconeogenesis and its reciprocal regulation with glycolysis.

(1 × 11 = 11 marks)

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2021

Biochemistry

BCH 4C 04—BIOCHEMISTRY—IV

(2014 Admissions)

Time : Three Hours

Maximum : 64 Marks

Section A

*Answer all questions.
Each question carries 1 mark.*

- Oxidation of fatty acids takes place in the _____.
(a) Nucleus. (b) Endoplasmic reticulum.
(c) Cytosol. (d) Mitochondria.
- _____ strengthens bones and teeth and is added to drinking water.
(a) Selenium. (b) Zinc
(c) Fluoride. (d) Copper.
- The daily dietary requirement of Vitamin A for men is :
(a) 900µg. (b) 700µg.
(c) 200µg. (d) 500µg.
- The hormone epinephrine is derived from the amino acid :
(a) Tyrosine. (b) Glycine.
(c) Valine. (d) Serine.
- Absorption of amino acids occurs mostly in the _____.
(a) Stomach. (b) Small intestine.
(c) Mouth. (d) Large intestine.
- Name the fat-soluble vitamin which is an important natural antioxidant.
- Digestion of lipids begins in the _____.

Turn over

8. Give two examples for ketogenic amino acids.
9. Name the coenzyme involved in transamination reaction.
10. Name the disease caused by Vitamin B₁ deficiency.

(10 × 1 = 10 marks)

Section B

*Answer any seven questions.
Each question carries 2 marks.*

11. Mention the biological functions of riboflavin.
12. Name the enzymes involved in lipid digestion. Mention their action on lipids.
13. Write down the site of biosynthesis of thyroxine and growth hormone.
14. What are macro minerals ? Give one example.
15. What do you mean by decarboxylation reaction?
16. Define glucogenic amino acid ? Give one example.
17. Write down the rate limiting step in cholesterol biosynthesis.
18. Give the biological role of iron.
19. Write down one biochemical reaction in which FMN is involved.
20. What is the biological function of epinephrine ?

(7 × 2 = 14 marks)

Section C

*Answer any four questions.
Each question carries 5 marks.*

21. How are proteins classified based on catabolism ?
22. Write note on trace minerals.
23. Briefly explain the similarities and differences between insulin and glucagon.
24. Outline cholesterol biosynthesis.
25. Give an account of the physiological functions of any two fat soluble vitamins.
26. Briefly explain the biosynthesis and degradation of glycine.

(5 × 4 = 20 marks)

Section D

Answer any two questions.

Each question carries 10 marks.

27. Elaborate on the source, physiological function and deficiency disorders of Vitamin -B₁, B₂, B₃ and B₆.
28. Explain digestion and absorption of lipids.
29. Detail on phenyl alanine metabolism.
30. Describe the mechanism of action, site of biosynthesis and physiological function of the following hormones (a) Glucagon ; (b) Glucocorticoids ; (c) Growth hormone ; (d) Thyroxine.

(2 × 10 = 20 marks)

CHMK LIBRARY UNIVERSITY OF CALICUT

C 2165

(Pages : 3)

Name.....

Reg. No.....

**FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2021**

Biochemistry

BCH 4B 05—BIOMOLECULES AND BIOINFORMATICS

(2014 Admissions)

Time : Three Hours

Maximum : 80 Marks

Section A

Answer all questions.

Each question carries 1 mark.

1. Name an optically inactive carbohydrate and an amino acid.
2. Name the two epimers of glucose.
3. _____ is an example of an essential fatty acid and _____ is an essential amino acid.
4. Mention the type of bond and linkage between the monosaccharide residues in sucrose.
5. The level of protein structure which remains intact even after protein denaturation is _____.
6. Write the three-letter code for amino acids : phenylalanine and tryptophan.
7. Give an example for a macromineral and a trace element.
8. Name two agents which are used for protein precipitation.
9. Which among the following is an imino acid ?
 - (a) Proline.
 - (b) Alanine.
 - (c) Methionine.
 - (d) Tyrosine.
10. Give an example for a phospholipid and a steroid.
11. Identify the active form of Vitamin D :
 - (a) Ergocalciferol.
 - (b) Calcitriol.
 - (c) 7-dehydrocholesterol.
 - (d) None of the above.

Turn over

12. Cytidine is a _____.
- (a) Nucleoside. (b) Nucleotide.
(c) Nitrogenous base. (d) Unusual base.
13. The melting point T_m of DNA increases with the increase in _____ content.
14. Name four fat soluble vitamins.
15. Which among the following vitamin is known as anti-pellagra vitamin ?
- (a) Niacin. (b) Riboflavin.
(c) Thiamine. (d) Pyridoxine.
16. The capped nucleotide sequence present in the acceptor arm of t-RNA is _____.

(16 × 1 = 16 marks)

Section B

*Answer any eight questions.
Each question carries 3 marks.*

17. What are compound lipids ? Give two examples.
18. Differentiate between 'salting out' and 'salting in' of proteins.
19. What are sugar acids and how are they formed ?
20. Write about any *four* biological functions of Vitamin C.
21. Give the structure of lactose and maltose.
22. What is meant by hyperchromic effect ?
23. List out the purine and pyrimidine present in RNA and DNA.
24. Write the structure of alanine and serine.
25. Define iodine number and mention its significance.
26. Write about any *four* biological functions of any *one* macro mineral.

(8 × 3 = 24 marks)

Section C

*Answer any four questions.
Each question carries 5 marks.*

27. Write about the chemistry of any two colour reactions of proteins.
28. Discuss briefly about the applications of bioinformatics.
29. Detail on the classification of lipids.
30. Give an account of any one DNA sequencing method.
31. Write a short essay on scoring matrices.
32. Write about the deficiency diseases associated with Vitamin D.

(4 × 5 = 20 marks)

Section D

*Answer any two questions.
Each question carries 10 marks.*

33. Give a detailed account of different biological databases.
34. Discuss in detail the general reactions of amino acids.
35. Give a detailed account of the double-helical structure of DNA.

(2 × 10 = 20 marks)