(Pages : 3) **N – 4076**

Reg. No. : .....

Name : .....

First Semester B.Sc. Degree Examination, June 2022

First Degree Programme under CBCSS

Biochemistry

Core Course I

BC 1141 : PERSPECTIVES, METHODOLOGY AND INTRODUCTION TO BIOCHEMISTRY

(2013-2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions in **one** word or maximum **2** sentences; **each** question carries **1** mark.

1. What is non-science?

2. Comment on practical knowledge.

3. Define precision.

4. What is anabolism?

5. Define Buffers.

6. Specify on molality.

7. What are sugar acids?

P.T.O.

8. Draw the structure of Maltose.

9. Give an example of unsaturated fatty acid.

10. Comment on iodine number.

(10 × 1 = 10 Marks)

SECTION – B

Answer any **eight** questions not to exceed **one** paragraph; **each** question carries **2** marks.

11. Explain briefly scientific knowledge.

12. What are the applications of dimension?

13. Describe the factors in selecting a measuring instrument.

14. Write a brief note on Berzelius's hypothesis.

15. Outline the significance of Buchner's discovery of cell-free fermentaion.

16. Describe a brief note on the rancidity of fat.

17. Write a short note on pKa.

18. What is normality?

19. What are hypertonic solutions?

20. Comment on stereoisomers.

21. Write reduction reaction of glucose.

22. Draw the structure of shingophospholipids.

(8 × 2 = 16 Marks)

SECTION – C

Answer any **six** questions short essay; **each** question carries **4** marks.

23. Illustrate the inductive model of formulating a hypothesis.

24. Write a short note on the Miescher experiment.

25. Describe any three types of instrumentation. Explain with examples.

26. Designate the role of ion-exchange chromatography in the purification of enzymes.

27. Write a note on Bronsted-Lowry's theory.

28. Discuss the biological significance of osmosis.

29. Write a detailed account on chitin.

30. Describe the structure and functions of ergosterol.

31. Outline the biological significance of glycerophospholipids.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions-long essays; **each** question carries **15** marks.

32. Describe Griffith's experiment in detail.

33. What are colloids? Explain its properties and applications in detail.

34. Enumerate in detail on structure and functions of glycogen.

35. Write an essay on the classification of lipids.

(2 × 15 = 30 Marks)

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(Pages : 4) **N – 4077**

Reg. No. : .....

Name : .....

First Semester B.Sc. Degree Examination, June 2022

First Degree Programme Under CBCSS

Biochemistry

Core Course I:

BC 1141 : PERSPECTIVES, METHODOLOGY AND BIOMOLECULES - I

(2020 Admission Onwards)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer the following questions in a word or in **one** or **two** sentences. **Each** question carries **1** mark.

1. Give the molecular formula of ergosterol.

2. Define the term metabolism.

3. Draw the Haworth projection formula of glucose.

4. Give an example each of saturated and unsaturated fatty acid.

5. Define molarity.

6. What are emulsifying agents? Give an example.

7. Explain iodine number.

8. What do you mean by a Bronsted acid and base?

P.T.O.

9. What are prostaglandins?

10. Name the scientist who sequenced protein for the first time.

(10 × 1 = 10 Marks)

SECTION – B

Write a paragraph on any eight of the following. **Each** question carries **2** marks.

11. What is meant by mutarotation.

12. Comment on Ramachandran plot.

13. What was the conclusions of Hershey Chase experiment?

14. Give the structure and functions of cholesterol.

15. Give the reaction of sugars with acids.

16. What do you mean by sensitivity of an instrument?

17. Give examples of pure and applied sciences?

18. Give an example each of heteropolysaccharide and homopoysaccharide which perform structural role.

19. Give an example of a non-reducing disachharide and its structure.

20. Point out the reason for lower melting point of oleic acid than stearic acid.

21. Name the scientists who experimentally demonstrated that simple organic compounds were formed in the reducing atmosphere by lightning.

22. Differentiate between simple triglycerides and mixed triglycerides.

23. Name the storage polysachharidein animal and give its structure.

24. Name the anomeric forms of fructose.

25. Name the steroid nucleus of which steroids are mostly derived from.

26. Who are the scientists who elucidated urea cycle?

(8 × 2 = 16 Marks)

SECTION – C

Short essays not exceeding 120 words. Answer any **six** questions. **Each** question carries **4** marks.

27. Elaborate the mechanism of action of bicarbonate buffer.

28. Comment on anomerism.

29. Elaborate the dissociation of weak acids.

30. Give the reaction of sugars with acetic anhydride.

31. Give the general structure and functions of prostaglandins.

32. Write a note on the significance of Donnan membrane equilibrium.

33. Give the structure of the constituent alcohol in sphingolipids.

34. Compare the sugarslactose and sucrose.

35. What is meant by normality? How will you prepare 500ml of 0.5N NaOH?

36. Discuss the different types of knowledge.

37. Give an account of lipoproteins.

38. Give an account of classification of unsaturated fatty acids.

(6 × 4 = 24 Marks)

SECTION – D

Long essay

Answer any **two** questions. **Each** question carries **15** marks.

39. Derive Henderson -Hasselbalch equation and explain its significance.

40. Explain the various approaches to study biochemical processes.

41. Discuss the works of early scientists who pioneered in various aspects of Biochemistry.

42. Write an essay on colloids and their biological significance.

43. Elaborate the classification and properties of polysaccharides.

44. Give a detailed account of classification, structure and nomenclature of fatty acids.

(2 × 15 = 30 Marks)

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(Pages : 4) **N – 4078**

Reg. No. : .....

Name : .....

First Semester B.Sc. Degree Examination, June 2022

First Degree Programme Under CBCSS

Chemistry

Complementary Course for Biochemistry

CH 1131.6 – THEORETICAL CHEMISTRY

(2020 Admission Onwards)

Time : 3 Hours Max. Marks : 80

SECTION – A

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

1. State Modern Periodic Law.
2. Define Half life.
3. What is Ionization Energy?
4. Explain Open System Closed system and Isolated system in thermodynamics.
5. What is Mass Defect?
6. Bond Angle of water molecule is ——————
7. What is meant by Packing Fraction?
8. Explain criteria for spontaneity.

P.T.O.

9. What is Hydrogen Bonding?

10. Define Dipole moment and write expression for it.

(10 × 1 = 10 Marks)

SECTION – B

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

11. Explain why orbitals like 1p, 2d, 3f are not possible.

12. What do you understand by Pauli,s Exclusion Principle?

13. What is diagonal relationship, illustrate with an example?

14. Define Entropy.

15. Distinguish Intensive and Extensive properties.

16. State Second law of thermodynamics.

17. What is Binding Energy?

18. Define Average life and how it is related to half life of radioactive elements.

19. Differentiate Hydrogen Bonding and Covalent bonding.

20. Define Free Energy, Write an expression for it.

21. Explain why Nitrogen has higher ionization energy than oxygen.

22. Explain the variation of atomic radius along the period and down the group.

23. Define Hybridization.

24. What is Lattice Enthalpy?

25. What is meant by Periodicity of an Element?

26. Electron affinities of Noble gases are zero, why?

(8 × 2 = 16 Marks)

SECTION – C

Answer any **six** questions. **Each** question carries **4** marks.

27. Explain First law of Thermodynamics and Zeroth Law of Thermodynamics.

28. What are the factors that govern Electron affinity?

29. State and explain Hund's Rule of Maximum Multiplicity.

30. What are the units of Radioactivity?

31. Write a note on the merits and demerits of Geiger-Muller Counter.

32. Explain the Hybridization of PCl_5.

33. Briefly Explain Fajan's Rule.

34. BF_3 has dipole moment zero, while that of NH_3 is 1.49D Substantiate.

35. Write a note on Reversible and Irreversible process.

36. Explain the Conditions of formation of Hydrogen bond.

37. What are the different blocks that constitute Periodic Table?

38. Half-filled and completely filled orbitals have extra stability, why?

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions. **Each** question carries **15** marks.

39. (a) Derive Gibbs Helmholtz Equation and its application. **10**

    (b) Explain Various thermodynamic processes. **5**

40. (a) Explain Born Haber Cycle with a suitable example. **8**

    (b) Write explanatory notes on Intra molecular and Intermolecular Hydrogen bonding with suitable examples. **7**

41. (a) Discuss sp^3d^3 hybrisation with suitable example. **7**

(b) Discuss n/p ratio for stability of nucleus, what is zone stability? **8**

42. (a) Write a note on Artificial Trans mutation. **4**

(b) Write a note on Wilson Cloud chamber. **4**

(c) Derive the relation between C_p and C_v. **7**

43. (a) Explain the postulates of VSEPR Theory. **6**

(b) Write a note on Polarization, Polarizing Power, and Polarisibility? **5**

(c) Molecules like H_2O, NH_3, CH_4 involve same kind of hybrisation, yet they possess different geometry. **4**

44. (a) Write a note on applications of Radioactivity. **7**

(b) State and explain theory of radioactive disintegration. **8**

(2 × 15 = 30 Marks)

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(Pages : 3) **M – 2435**

Reg. No. : .....

Name : .....

Second Semester B.Sc. Degree Examination, December 2021

First Degree Programme under CBCSS

Biochemistry

Foundation Course – II

BC 1221 : GENERAL INFORMATICS AND BIOINFORMATICS

(2014 – 2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – I

(Very Short answer type – maximum **2** sentences)

(Answer **all** questions)

1. Name any one features of a Modern Computer.
2. Define Internet.
3. Explain the functions of NICNET.
4. Discuss Knowledge Management.
5. Explain Sample Number.
6. Write in short about regression.
7. Name any one plasma protein.
8. List any two aromatic amino acids.
9. Explain Helix to random coil transition.
10. Give an example of Biological database.

(10 × 1 = 10 Marks)

P.T.O.

SECTION – II

(Short answer questions – Not to exceed **1** paragraph)

(Answer any **eight** questions)

11. Name any two input devices of a Modern computer.
12. Name any two operating systems.
13. What are the benefits of IPR protection?
14. Give any two examples of IT in teaching and learning.
15. Explain Distribution function point.
16. Write a note on Heavy metal precipitation of proteins.
17. Define Isoelectric points of a protein.
18. Explain any one chemical reaction of amino acids.
19. Write a note on Hypochromic effect of DNA.
20. What is the nature of genetic material?
21. Explain Bibliographic database.
22. Write a note on the types of Database.

(8 × 2 = 16 Marks)

SECTION – III

(Short Essay – Not to exceed **120** words)

(Answer **any six** questions)

23. Discuss Computer Network and its uses.
24. Compare Modern Computer features with old Computer Technology.

25. What are the benefits of Patenting?

26. How is Plagiarism verified? Why is it done?

27. Explain the types of correlation.

28. Write a note on Hemoglobin.

29. Explain the types of RNA and DNA.

30. Write a note on DNA supercoiling.

31. Explain any one organism specific database.

(6 × 4 = 24 Marks)

SECTION – IV

(Long Essay)

(Answer any **two** questions)

32. Elaborate on the major application of software.

33. Discuss the method, significance and uses of student's *t*-test.

34. Describe structure of proteins.

35. Give a detailed account of structure of Nucleic acids.

(2 × 15 = 30 Marks)

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(Pages : 3) **M – 2437**

Reg. No. : .....

Name : .....

Second Semester B.Sc. Degree Examination, December 2021

First Degree Programme under CBCSS

BIOCHEMISTRY

Complementary Course II for Botany and Zoology

BC 1231 : BIOMOLECULES

(2014–2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – I

(Very short answer type-maximum two sentences)

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

1. Give an example of a carbohydrate possessing nitrogen atom in its molecule?
2. What are reducing sugars?
3. Define peroxide value.
4. Name any two plasmalogens.
5. Why proline is called an imino acid?
6. Which reagent is used in the Edman degradation reaction for amino acid sequencing?
7. Which type of RNA is also called soluble RNA?
8. What is Z- DNA?
9. What are peptide hormones? Give an example.
10. Mention the site of biosynthesis of secretin.

(10 × 1 = 10 Marks)

P.T.O.

SECTION – II

(Short answer questions-not to exceed **one** paragraph)
Answer any **eight** questions.

11. Differentiate between isomers and epimers using suitable monosaccharides as examples.

12. Describe the formation of pyranose ring structure of glucose.

13. What are glycosamino glycans? Give two examples.

14. What is meant by essential fatty acids? Give two examples.

15. Draw the structure of cholesterol. Mention its biological functions.

16. Explain the role of proteases in the determination of primary structure of proteins.

17. Describe the forces stabilising tertiary structure of proteins.

18. What is meant by isoelectric point?

19. Draw the structures of purines and pyrimidines present in DNA.

20. What are nucleosides? Give two examples.

21. Mention the function of t RNA.

22. What are thyroid hormones? Mention any one example with structure.

(8 × 2 = 16 Marks)

SECTION – III

(Short Essay-not to exceed 120 words)
Answer any **six** questions.

23. Give an account of any two colour reactions of carbohydrates.

24. How the structure of cellulose helps in its functional properties?

25. Give an account of the classification of lipids.

26. Write a note on the colour reactions of sterols.

27. Give an account of protein denaturation.

28. How amino acids are classified as essential and non essential? Give examples and list out the sources of essential amino acids.

29. Compare DNA and RNA.

30. Why ATP is called a high energy compound? Draw its structure.

31. Write a note on the classification of hormones.

(6 × 4 = 24 Marks)

SECTION – IV

(Long Essay)
Answer any **two** questions.

32. Elaborate the structure and functions of sucrose, lactose, maltose, starch and glycogen.

33. Give an account of the structure and functions of any five phospholipids.

34. Explain the salient features of Watson and Crick double helical model of DNA.

35. Write a note on the site of biosynthesis, structural features and functions of any five steroid hormones.

(2 × 15 = 30 Marks)

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(Pages : 3) **M – 2438**

Reg. No. : .....

Name : .....

Second Semester B.Sc. Degree Examination, December 2021

First Degree Programme under CBCSS

BIOCHEMISTRY

Foundation Course II

BC 1221 : BIOMOLECULES–II AND BIOINFORMATICS

(2020 Admission Regular)

Time : 3 Hours Max. Marks : 80

SECTION – A

Write answers in one sentence to maximum of **two** sentences. **Each** question carries **1** mark.

1. Name the bond that connect two nucleotides.
2. What is the charge of aspartate at isoelectric pH?
3. How many nitrogen atoms are present in a pyrimidine?
4. Which amino acid has indole group in it?
5. What is the difference between ribose and deoxy ribose?
6. What is aspartame?
7. Name two academic search engines.
8. What is a pie diagram?
9. What type of bond is formed during base pairing?
10. Name two amino acids seen very rarely in proteins.

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

Write answer for any **eight** questions without exceeding one paragraph. **Each** question carries **2** marks.

11. Mention the characteristic features of a peptide bond.
12. What are motifs and domains?
13. Mention the relevance of salting out in protein research.
14. Point out the importance of PDB?
15. What do you know about Chargaff's rule?
16. Mention the amino acid composition and functions of glutathione.
17. What do you mean by sequence alignment?
18. Explain purposive sampling.
19. What is a zwitter ion?
20. What do you mean by probability theory?
21. Why do we carry out Sakaguchi's reaction?
22. What is the use of model organism database?
23. What do you mean by random sampling?
24. Name two aromatic amino acid and two basic amino acids
25. Distinguish between essential and non-essential amino acids.
26. What information do you get from a microarray database?

(8 × 2 = 16 Marks)

SECTION – C

Write answers for any **six** questions without exceeding 120 words. **Each** question carries **4** marks.

27. Write a note on nucleotide databases.
28. What do you mean by secondary structure of proteins?

29. With suitable example, explain the quaternary structure of proteins. What are the forces that stabilize structure of proteins?

30. Detail the applications of bioinformatics in life science research.

31. Write a note on the denaturation of nucleic acids.

32. Distinguish between primary and secondary data collection.

33. Discuss the physiological relevance of non-protein amino acids.

34. Give an idea about sequence analysis tools.

35. Detail the importance of educational softwares.

36. What are the different graphical methods for presenting the experimental data?

37. Discuss the Watson-Crick's model of DNA.

38. Point out the applications of artificial intelligence and robotics in medicine

(6 × 4 = 24 Marks)

SECTION – D

Write answers for any **two** essays. **Each** question carries **15** marks.

39. Explain a method for the determination of amino acid sequence of proteins.

40. Write an essay on the structure and functions of RNA

41. Give an idea about measures of central tendency. How will you check the significance of a scientific data by student's t test?

42. Elaborate on the significance of various types of plasma proteins

43. Point out the relevance of omic studies in life science research

44. Write an essay on IPR.

(2 × 15 = 30 Marks)

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(Pages : 3) **M – 2439**

Reg. No. : .....

Name : .....

Second Semester B.Sc. Degree Examination, December 2021

First Degree Programme under CBCSS

Biochemistry

Complementary Course II for Botany and Zoology

BC 1231 : BIOMOLECULES

(2020 Admission Regular)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer the following questions in a word or in **one** or **two** sentences. **Each** question carries **1**mark.

1. Which law states that in DNA base pairing no. of purines is equal to no. of pyrimidines ?
2. Name an amino acid with epsilon amino group.
3. Give an example of saturated fattyacid synthesized in our body.
4. Give the name of two ketogenic aminoacids.
5. Physiological importance of vasopressin.
6. Precursor of vitamin D.
7. What is saponification number?
8. Nitrogen base present only in RNA.

P.T.O.

9. Surfactant seen in lungs.

10. Give an example of a protein with quaternary structure.

(10 × 1 = 10 Marks)

SECTION – B

Write a paragraph on any **eight** of the following. Each questions carries **2** marks.

11. What is zwitterion? Importance of isoelectric pH.

12. What are essential and nonessential fatty acid?

13. Differentiate nucleotides and nucleosides.

14. How we can identify the spoilage or degradation of oil?

15. What are protein motifs? Give significance.

16. Discuss on protein denaturation methods.

17. Give the structure of lactose. What products will be produced by acid hydrolysis of lactose?

18. Give the structure of cholesterol

19. Why glucose and fructose gives same types of osazones.

20. Distinguish between globular and fibrous proteins.

21. Discuss on plasma proteins.

22. Differentiate anomerism and epimerism.

23. Significance of Reichert-Meissl number.

24. What are heteropolysaccharides? Give an example of heteropolysaccharide which acts as an anticoagulant.

25. Give the structure of trehalose and its significance.

26. Structure and importance of MSH.

(8 × 2 = 16 Marks)

SECTION – C

Short essay questions. Answer any **six** of the following. Each question carries **4** marks.

27. Protein sequencing using Edmann's degradation method.
28. Discuss on isomerism in carbohydrates.
29. Discuss the importance of cyclic nucleotides.
30. Discuss on the mechanism of action of hormones.
31. Haworth formula for sucrose lactose, maltose. Discuss the importance.
32. What are non-protein amino acids?
33. Discuss on the forces that stabilizes the structure of proteins.
34. Explain oxidation of glucose.
35. Which precipitation methods can be employed in the purification of proteins?
36. Discuss on the colour reactions of carbohydrates.
37. Discuss on amino acid derived hormones.
38. Draw the structures of D and L-fructose.

(6 × 4 = 24 Marks)

SECTION – D

(Long Essay)

Answer any **two** of the following. Each question carries **15** marks.

39. Draw and explain Watson and Crick model of DNA.
40. Write an essay on classification of lipids.
41. Describe the different levels of structural organization of proteins.
42. Briefly explain the classification of amino-acids.
43. Write an essay on Polysaccharides.
44. Discuss on Colour reactions in aminoacids.

(2 × 15 = 30 Marks)

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(Pages : 4) **M – 2440**

Reg. No. : .....

Name : .....

Second Semester B.Sc. Degree Examination, December 2021

First Degree Programme Under CBCSS

Chemistry

Complementary Course for Biochemistry

CH 1231.6 – PHYSICAL AND ANALYTICAL CHEMISTRY – I

(2020 Admission Regular)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** (answer in one word/sentences)

1. Define equilibrium constant.

2. What is Lewis acid? Give example.

3. What do you mean by pH scale?

4. Give two uses of buffer.

5. What is primary standard?

6. Define 1N solution.

7. Give examples for redox indicators.

8. Calculate the normality of NaOH solution when 20g is dissolved in 500ml water.

9. Complete the equation $CH_3COOH + NaOH \rightarrow$.

10. What is bond energy?

(10 × 1 = 10 Marks)

SECTION – B

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

11. What are the factors affecting equilibrium constant?

12. What is law of mass action?

13. Explain the role of pressure in reversible reaction.

14. Define Le Chateliers principle.

15. Explain Bronsted theory of acids with example.

16. What do you mean by degree of hydrolysis?

17. Explain ionisation constant of water.

18. Explain common ion effect.

19. Define molarity.

20. Calculate the mass of sodium carbonate required to prepare 2M, IL solution?

21. Draw the titration curve for strong acid Vs strong base.

22. What do you mean by redox titrations?

23. What is enthalpy of neutralisation?

24. Given the following enthalpies of reaction

$H_2 + F_2 \rightarrow 2HF_{(g)}$ $\Delta H = -537$ KJ

$C + 2F_2 \rightarrow CF_{4(g)}$ $\Delta H = -680$ KJ

$2C + 2H_2 \rightarrow C_2H_{4(g)}$ $\Delta H = -52.3$ KJ

Calculate the ΔH for the reaction of $C_2H_{4(g)}$ with F2 to make CF_4 and HF?

25. Define Hess's law.

26. What is bond dissociation energy?

($8 \times 2 = 16$ Marks)

SECTION – C

Answer **any six** questions. Each question carries **4** marks.

27. Explain Arrhenius theory of acids and bases.

28. Explain the effect of temperature and pressure in Haber process.

29. Give relationship between Kp and Kc.

30. Explain the relation between ionic product and solubility product.

31. Explain Salting out process.

32. Explain buffer action.

33. Explain the principle of permaganonmetric titration.

34. What do you mean by pKa and pKb?

35. What is the pH of a 6.50×10^{-3} M KOH solution?

36. Give a direct application of first law of thermodynamics in thermochemistry.

37. Explain bond enthalpy with example.

38. The enthalpy of formation of methane at constant pressure and at 300K is 75.83 KJ. What will be the enthalpy of formation at constant volume?

(6 × 4 = 24 Marks)

SECTION – D

Answer **any two** questions. Each question carries **15** marks.

39. Apply Le Chatelier's principle-pressure, temperature and concentration effect on formation of SO_3 from SO_2 and O_2?

40. Explain the theory of acid base indicators and redox indicators with example.

41. Explain the hydrolysis of salt by taking examples of salt of weak acid-strong base, strong acid-weak base, strong acid-strong base and weak acid-weak base, also explain how the pH variation happens in each case?

42. (a) Illustrate Hess's Law.

    (b) Heat of formation of $CO_2(g)$, H_2O (I) and $CH_4(g)$ are –94.0,– 68.4 and –17.9 kcal respectively. Calculate the heat of combustion of methane?

43. How the principles of solubility product and common ion effects are used in qualitative analysis of inter group separation?

44. Explain the principle and procedure for permagnometric titration (double burette method.

(2 × 15 = 30 Marks)

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(Pages : 4) **N – 2647**

Reg. No. : .....

Name : .....

Third Semester B.Sc. Degree Examination, March 2022

First Degree Programme under CBCSS

Chemistry

Complementary Course for Biochemistry

CH 1331.6 : INORGANIC AND ORGANIC CHEMISTRY AND SPECTROSCOPY

(2013 – 2016 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Very short answer type

Answer **all** questions. Answer in **one** word to maximum of **two** sentences. Each question carries **1** mark.

1. What is the geometry of XeF_2 molecule?

2. Draw the stable conformation of cyclohexane.

3. Explain the variation of electronegativity down a group.

4. What kind of bond fission yield charged fragments?

5. Which isomer of dichlorobenzene has dipole moment?

P.T.O.

6. Give example for a chelate complex.

7. Explain the action of morphine.

8. Write the selection rule for microwave spectrum.

9. Explain cis-trans isomerism in complexes.

10. Write the structure of Thiophene.

(10 × 1 = 10 Marks)

SECTION – B

Short answer type (Not to exceed one paragraph)

Answer **any eight** question from the followings. Each question carries **2** marks.

11. Predict the structure of IF_5 and IF_7.

12. Of cis and trans 1, 2 dichloroethenes, which has zero dipole moment? Why?

13. Give one method for preparation of Furan.

14. Write a note on Baker-Nathan effect.

15. What are aldoximes?

16. Briefly the discuss the mechanism of S_N1 reactions in alkyl halides.

17. Write a note on steric effect?

18. What are the various types of absorption spectra of molecules?

19. Explain axial and equatorial bonds.

20. Explain the directive effect of substituents with suitable examples.

21. Explain Markownikoff's rule.

22. What is rotational constant? Write an expression for it and explain the terms.

(8 × 2 = 16 Marks)

SECTION – C

Short essay (Not to exceed 120 words)

Answer **any six** question from the followings. Each question carries **4** marks.

23. Discuss sp^2 hybridization with suitable example.

24. What are low spin and high spin complexes?

25. Write the Mechanism of S_N2 reaction.

26. Write a note on Hoffman's exhaustive methylation.

27. Comment on magnetic properties of coordination complexes.

28. Give the expression for the frequency of vibration in vibrational spectroscopy and explain the terms? Explain force constant.

29. Give the structure and action of alkaloids Nicotine and Coniine.

30. Compare Inductive effect and Mesomeric effect.

31. The force constant of H^1Cl^{35} is 480 Nm^{-1}. Calculate the fundamental stretching frequency of HCI and the wave number of the absorbed radiation.

(6 × 4 = 24 Marks)

SECTION – D

Long essay

Answer **any two** question from the followings. Each question carries **15** marks.

32. Explain Born Haber cycle? What are its applications? **15**

33. Explain structural and stereo isomerism possible in complexes. **15**

34. (a) Explain Paulings scale of electronegativity. **5**

(b) Explain VSEPR theory, using the theory explain shapes of

(i) NH_4^+ and NH_3

(ii) H_2O and H_3O^+. **10**

35. (a) Comment on the stability of different conformers of ethane. **5**

(b) Write a note on optical isomerism. Explain different methods for resolution of optical isomers? **10**

($2 \times 15 = 30$ Marks)

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(Pages : 4) **N – 2648**

Reg. No. : .....

Name : .....

Third Semester B.Sc. Degree Examination, March 2022

First Degree Programme under CBCSS

Chemistry

Complementary Course for Biochemistry

CH 1331.6 — INORGANIC AND ORGANIC CHEMISTRY AND SPECTROSCOPY

(2017 – 2018 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

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

1. What is a chiral carbon?
2. Give the IUPAC name for the following compound. $\left[Co\left(NH_3\right)_6\right]Cl_3$.
3. What is the geometry of XeF_4?
4. Give an example for a chelating ligand.
5. Draw the structure of nicotine.
6. Arrange the following radiations in the increasing order of energy: Visible, X-rays, Microwaves, Cosmic rays and Infrared rays.
7. What is the intermediate formed in electrophilic aromatic substitution reaction?

P.T.O.

8. What is heterolytic bond fission?

9. What is the state of hybridisation of the central atom in ClF_5?

10. What is a racemic mixture?

(10 × 1 = 10 Marks)

SECTION – B

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

11. Explain the selection rule for rotational Spectroscopy.

12. Distinguish between inter- and intra-molecular hydrogen bonding.

13. What is the absolute configuration of L-lactic acid?

14. Compare the basicity of furan, pyridine and pyrrole. Explain.

15. What are the different types of energy levels in a molecule?

16. What is electromeric effect?

17. Explain Mullikan's electronegativity scale.

18. What are low spin complexes? Give an example.

19. Trialkyl amines are less nucleophilic. Why?

20. Give a method for the synthesis of furan.

21. What are rotational isomers?

22. What is Chichibabin reaction?

(8 × 2 = 16 Marks)

SECTION – C

Answer **any six** questions. Each question carries **4** marks.

23. Explain Born-Haber cycle.

24. The fundamental vibrational frequency of CO is 2134 cm^{-1}, Calculate the force constant of the C-O bond. (The atomic mass of C - 19.9×10^{-27} kg; O - 26.6×10^{-27} kg).

25. What are the general properties alkaloids?

26. Discuss about the structural isomerism in coordination compounds.

27. Explain the effect of substrate structure on the reactivity of S_N1 and S_N2 reactions.

28. Explain the conformations of cyclohexane.

29. Explain the effect of hydrogen bonding on boiling point, volatility and solubility.

30. The first line in the rotational spectrum of HCI is at 21.18 cm^{-1}. Calculate the bond length of the molecule. (The atomic mass of H – 1.673×10^{-27} kg; Cl -58.06 $\times 10^{-27}$ kg).

31. Hoffmans exhaustive methylation.

($6 \times 4 = 24$ Marks)

SECTION – D

Answer **any two** questions. Each question carries **15** marks.

32. Discuss about the VB theory of coordination compounds and its drawbacks.

33. Explain the mechanism of electrophilic aromatic substitution and the effect of substituents on further substitution.

34. Discuss about VSEPR theory and its applications.

35. Explain

(a) Optical isomerism

(b) Resolution of racemic mixtures

(c) Asymmetric synthesis.

(2 × 15 = 30 Marks)

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(Pages : 3) **N – 2649**

Reg. No. : .....

Name : .....

Third Semester B.Sc. Degree Examination, March 2022

First Degree Programme under CBCSS

Biochemistry

Core Course II

BC 1341 : CELLULAR BIOCHEMISTRY

(2013 – 2018 Admission)

Time : 3 Hours **Max. Marks : 80**

SECTION – A

Answer the following **ten** questions in a word or in one or two sentences. **Each** question carries **1** mark.

1. What is meant by M-M equation?

2. Define Holoenzyme.

3. What is a Cell line?

4. Name the single membrane bound organelles.

5. How cells are joined?

6. What are the functions of Golgi complex?

7. What are the types of cell - cell interactions?

8. Which phase follows the S phase in the cell cycle?

P.T.O.

9. Name the phases of cell cycle.

10. What are microbodies?

(10 × 1 = 10 Marks)

SECTION – B

Write a paragraph on any **eight** of the following. Each question carries **2** marks.

11. Draw a labelled diagram of Anaphase.

12. What are the three main functions of lysosome?

13. What are the cell adhesion molecules?

14. Give note on endocytosis?

15. Write a note on zymogens.

16. State cell theory.

17. State an example of simple diffusion and facilitated diffusion.

18. Give the Fluid Mosaic Model of a Plasma Membrane.

19. Brief outline of apoptosis.

20. What does "S" stand for in the 70S and 80S ribosome?

21. Mention the character of the Anphase- 1.

22. Structure and function of Plasmodesmata.

(8 × 2 = 16 Marks)

SECTION – C

Short essay not exceeding **120** words. Answer any **six** of the following. Each question carries **4** marks.

23. Brief note on feedback inhibition.

24. Describe the structure of a eukaryotic cell with the help of a Diagram.

25. Write short note on ion channels.

26. Differentiate Rough Endoplasmic Reticulum and Smooth Endoplasmic Reticulum.

27. Write short note on Reversible enzyme inhibitor.

28. Describe the effect of substrate concentration and L-B Plot.

29. Discuss the basic properties and characteristics of cancer cells.

30. Write a short note on Activation energy.

31. Comment on tight junction, gap junction and cell wall.

(6 × 4 = 24 Marks)

SECTION – D

Long Essay - Answer any **two** questions. Each carries **15** marks.

32. Differentiate eukaryotic and prokaryotic cell structure with neat diagram.

33. Comparison of Mitosis and Meiosis.

34. Discuss the various types of transport mechanism across the membrane with suitable examples.

35. Describe enzyme kinetics and derive M-M equation.

(2 × 15 = 30 Marks)

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(Pages : 4) **N – 2652**

Reg. No. : .....

Name : .....

Third Semester B.Sc. Degree Examination, March 2022

First Degree Programme Under CBCSS

Biochemistry

Core Course II

BC 1341 –– CELLULAR BIOCHEMISTRY

(2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer the following questions in a word or in **one** or **two** sentences. **Each** question carries **1** mark.

1. State the postulates of cell theory.

2. To which organelle cellular respiration is associated with?

3. What are integral membrane proteins? Give an example.

4. Which is the primary source of energy for active transport of molecules across the cell membrane?

5. Define cell cycle.

6. What is meant blebbing?

7. Mention the functions of desmosomes.

P.T.O.

8. What are the functions of extra cellular matrix?

9. Name two vitamin-derived coenzymes.

10. What is meant by feedback inhibition? Give an example.

(10 × 1 = 10 Marks)

SECTION – B

Write a paragraph on any **eight** of the following. **Each** question carries **2** marks.

11. Describe the structure of animal cell nucleus. Explain its role in cellular reproduction.

12. Understanding cell biology is important to understand the basis for diseases. Justify the statement.

13. Why plasma membrane is said to be selectively permeable?

14. Explain primary and secondary active transport.

15. Explain the role of cyclin in cell cycle.

16. Differentiate between apoptosis and necrosis.

17. Malignant cells are not responsive to inhibitory stimuli. Explain.

18. What are the functions of collagen as a component of extra cellular matrix?

19. Describe gap junctions.

20. What are cadherins? Mention their function.

21. What is meant by activation energy? How do enzymes affect it?

22. Describe the functions of Biotin.

23. What are the different units of enzyme activity?

24. Write down a reaction that involves TPP.

25. How does substrate concentration affect enzyme activity?

26. Explain the significance of Km.

(8 × 2 = 16 Marks)

SECTION – C

Short essay not exceeding **120** words. Answer any **six** questions. Each question carries **4** marks.

27. Compare prokaryotic and eukaryotic cells with the help of diagrams.

28. Draw the diagram of mitochondria and explain its functions.

29. What are voltage gated channels? Explain their mechanism with an example.

30. Write a note on the cellular events involved in meiosis.

31. Write a note on plant cell wall.

32. Write a note on plasmodesmata.

33. Write a note on enzyme specificity.

34. Give an account of PLP as a coenzyme.

35. Describe the role of coenzymes in enzyme action.

36. Explain double reciprocal plots and comment on their significance in the analysis of enzyme kinetics.

37. Write a note on zymogens, with examples.

38. Give an account of non competitive inhibition of enzymes with examples.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions. **Each** question carries **15** marks.

39. Compare animal, plant and microbial cells, with the help of diagrams. Explain how the structural features of each help them in fulfilling their respective functions.

40. Write an essay on the different mechanisms for the transport of molecules across the plasma membrane.

41. Describe the properties of cancer cells. Explain how these features make them grow uncontrollably.

42. Write an essay on cell-cell interactions.

43. Write notes on

    (i) holoenzymes and apoenzymes with examples

    (ii) enzyme specificity

    (iii) abzymes

44. How do allosteric regulation and presence of inhibitors affect enzyme catalysed reactions? Explain with suitable examples.

(2 × 15 = 30 Marks)

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(Pages : 3) **N – 2653**

Reg. No. : .....

Name : .....

Third Semester B.Sc. Degree Examination, March 2022

First Degree Programme under CBCSS

Biochemistry

Core Course II

BC 1341 : CELLULAR BIOCHEMISTRY

(2020 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions in **one** word or in **two** sentences. Each question carries **1** mark.

1. Define cell wall.
2. Write ‘g’ and ‘t’ required for mitochondria pellet formation.
3. Define plasmolysis.
4. What is mean for endocytosis?
5. Write the any two anti-apoptotic protein.
6. In which conditions the acid phosphates is elevated?
7. Write any two ECM proteins.
8. Define apoenzyme.

P.T.O.

9. In which conditions, the CK is elevated?

10. Expand LDH.

(10 × 1 = 10 Marks)

SECTION – B

Answer any **eight** questions, not exceeding one paragraph. Each question carries **2** marks.

11. Write any two functions of lysosome.

12. Give short note on nucleus.

13. Write brief note on Glyoxysomes.

14. List out the methods of transport across the membrane.

15. What is simple diffusion?

16. List out the type of ion channels.

17. What is necrosis?

18. Name the different phases of cell cycle.

19. What is the major function of the extracellular matrix?

20. Write the four major groups of cell adhesion molecule.

21. What is collagen?

22. What are ribozymes?

23. Define coenzymes.

24. Write any two functions of biotin.

25. What are zymogens?

26. Write a note on acid-base catalysis.

(8 × 2 = 16 Marks)

SECTION – C

Answer any **six** questions, short essay. Each question carries **4** marks.

27. Explain the structure and functions of golgi complex.
28. Write the major differences between prokaryotic and eukaryotic cell.
29. Explain Danielli and Davson membrane model.
30. Give a brief note on glucose transporters.
31. Write the clinical significance of PSA.
32. Explain the role of P^{53} in the regulation of cell cycle.
33. Write the structure and function of tight junction.
34. Describe the functions of proteoglycans.
35. Give short note on enzyme specificity.
36. What is an allosteric site? Illustrate.
37. Write short note on competitive inhibition.
38. Point out the clinical significance of CK.

($6 \times 4 = 24$ Marks)

SECTION – D

Answer any **two** questions, Long Essay Type. Each question carries **15** marks.

39. Write the structure and functions of chloroplast and mitochondria.
40. Describe with diagrammatic representation of primary active transport pumps.
41. Elaborate the different phases of mitosis.
42. Describe in detail about gap junction and desmosomes.
43. Discuss the mechanism of lock and key hypothesis and the induced fit hypothesis.
44. Write an essay about LDH and its clinical significance.

($2 \times 15 = 30$ Marks)

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(Pages : 3) **N – 7865**

Reg. No. : .....

Name : .....

Fourth Semester B.Sc. Degree Examination, August 2022

First Degree Programme under CBCSS

Biochemistry

Core Course III

BC 1441 : TECHNIQUES IN BIOCHEMISTRY

(2013 – 2018 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** the following questions in a word or in **one** or **two** sentences. **Each** question carries **1** mark.

1. What is the relationship between transmittance and absorbance?

2. Name a technique used for the quantification of mineral elements in biological samples.

3. What sort of waves are used in ultrasonic disintegration of tissues?

4. What is lyophilization?

5. Name two cation exchange resins.

6. What is retention time?

7. What is the net charge on a protein molecule when the pH of its medium is less than its isoelectric point?

P.T.O.

8. What is the value of one Svedberg?

9. Name the salt used for preparing density gradient solution.

10. Name two beta emitters.

(10 × 1 = 10 Marks)

SECTION – B

Write a paragraph on any **eight** of the following. Each question carries **2** marks.

11. Principle of spectrophotometry

12. Silica gel G

13. Absorption spectrum

14. Dialysis

15. Applications of paper chromatography

16. FID

17. Ethedium bromide

18. Principle of isoelectric focusing

19. Swinging bucket rotors.

20. Sedimentation coefficient

21. Curie

22. Decay constant

(8 × 2 = 16 Marks)

SECTION – C

Short essays not exceeding **120** words. Answer any **six** of the following. **Each** question carries **4** marks.

23. Explain the principle and applications of phase contrast microscope.

24. Outline a suitable method for desalting a solution.

25. Explain the principle and applications of ion exchange chromatography

26. How are simple sugars separated and detected by paper chromatography?

27. Explain the parts of a GLC system with a diagram.

28. Outline a suitable technique for the separation of DNA molecules in a solution.

29. Explain a centrifugation technique for cell fractionation.

30. Discuss the biological hazards of radiation.

31. Explain the principle and applications of scintillation counter.

(6 × 4 = 24 Marks)

SECTION – D

Long Essay. Answer any **two** of the following. **Each** question carries **15** marks.

32. Explain the principle, instrumentation and applications of a flame photometer.

33. Discuss the principle, procedure and applications of affinity chromatography.

34. Describe the principle, procedure and applications of SDS-PAGE.

35. Give an account of isotopes used in tracer studies.

(2 × 15 = 30 Marks)

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(Pages : 3) **N – 7866**

Reg. No. : .....

Name : .....

Fourth Semester B.Sc. Degree Examination, August 2022

First Degree Programme Under CBCSS

Chemistry

Complementary Course for Biochemistry

CH 1431.6 : ORGANIC CHEMISTRY AND SPECTROSCOPY II

(2013-2016 Admissions)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** (answer in one word / sentence)

1. Write one example for chromatography technique?
2. Name one reference compound used in NMR.
3. Define isoprene rule.
4. Give one example for condensation polymerisation.
5. Draw the structure of geraniol.
6. What is chemisorption?
7. What are isotonic solution?
8. Write one example for emulsion system.

P.T.O.

9. What are the bases present in RNA?

10. What are stokes line?

(10 × 1 = 10 Marks)

SECTION – B

Answer **any eight**. **Each** question carries **2** marks. (short answer type)

11. What is Nylon-6?

12. Define Tyndal effect.

13. What is iodine value?

14. What are the applications of colloids?

15. Explain mutual exclusion principle.

16. What is elastic and inelastic scattering?

17. What is meant by the term gold number?

18. Explain zeta potential.

19. Differentiate RNA and DNA.

20. Define Rf value.

21. Write any two disadvantages of Raman spectroscopy.

22. Explain the vulcanization process.

(8 × 2 = 16 Marks)

SECTION – C

Answer **any six**. **Each** question carries **4** marks. (short essay)

23. Explain thin layer chromatography technique.

24. What are the applications of gas chromatography?

25. Write a short note on lipids.

26. Distinguish between BUNA-N and BUNA-S.

27. Explain the differences between chemisorption and physisorption.

28. Explain molecular mass method determination by osmosis method.

29. Explain why Raman spectroscopy is complementaty to IR spectroscopy.

30. Describe Langmuir adsorption theory.

31. What is spin-spin coupling?

(6 × 4 = 24 Marks)

SECTION – D

Answer **any two**. **Each** question carries **15** marks. (essay)

32. Discuss the various properties of colloids.

33. Discuss the structure of nucleic acid and its biological role.

34. Elaborate on the principle and application of NMR spectroscopy.

35. Discuss the classification of polymers with example.

(2 × 15 = 30 Marks)

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(Pages : 3) **N – 7867**

Reg. No. : .....

Name : .....

Fourth Semester B.Sc. Degree Examination, August 2022

First Degree Programme Under CBCSS

Chemistry

Complementary Course for Biochemistry

CH 1431.6 : ORGANIC CHEMISTRY & SPECTROSCOPY II

(2017 - 2018 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. Answer in one word to maximum two sentences. **Each** question carries **1** mark.

1. Predict the total number of peaks in the ^{1}H NMR spectrum of acetone.
2. Draw the structure of geraniol.
3. Name the heterocyclic bases present in DNA.
4. What are essential oils?
5. Define iodine value of an oil.
6. What is the monomer of neoprene?
7. Define R_f value.
8. What are phospholipids?
9. Define chemical shift.
10. What is Buna-N?

(10 × 1 = 10 Marks)

SECTION – B

Short answer type. Answer any **eight** questions from the following. **Each** question carries **2** marks.

11. What is an emulsion?
12. What are the different types of polymerizations?
13. State and explain isoprene rule.

P.T.O.

14. What are elastomers?
15. Differentiate between true solution and colloid.
16. Explain the preparation of Nylon-6.
17. What is meant by genetic code?
18. Differentiate between lyophilic and lyophobic colloids.
19. Describe reverse osmosis for sea water.
20. Define osmotic pressure.
21. What is adsorption chromatography?
22. What are the advantages of Raman spectroscopy?

(8 × 2 = 16 Marks)

SECTION – C

Short essay type. Answer any **six** questions from the following. **Each** question carries **4** marks.

23. Write a note on TMS.
24. Explain the structure of nucleic acids.
25. Explain the osmotic pressure method for the determination of molar mass.
26. Raman spectrum is complimentary with IR spectrum. Justify.
27. Differentiate between oils, fats and waxes.
28. Distinguish between thermoplastics and thermosetting plastics.
29. Differentiate between plastics, elastomers and fibers.
30. Explain ion exchange chromatography.
31. Explain the Biological role of DNA.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions. **Each** question carries **15** marks.

32. Discuss about
    (a) Applications of Gas chromatography.
    (b) Thin layer chromatography.
33. Explain
    (a) Factors influencing chemical shift.
    (b) Spin-spin coupling in ^{1}H NMR spectrum of ethylbromide.

34. Explain

(a) Cleansing action of soap.

(b) Explain Hardy-Schultz rule.

35. Write a note on

(a) Sedimentation potential

(b) Applications of colloids.

($2 \times 15 = 30$ Marks)

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(Pages : 4) **N – 7868**

Reg. No. : .....

Name : .....

Fourth Semester B.Sc. Degree Examination, August 2022

First Degree Programme Under CBCSS

Biochemistry

Core Course III

BC 1441 : TECHNIQUES IN BIOCHEMISTRY

(2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Very Short Answer Type – Maximum Two sentence – Answer **ALL** questions.

1. Name any two chemicals used in perfonning density gradient centrifugation.
2. What is Svedberg unit?
3. What is the principle of partition chromatography?
4. What is dialysis?
5. Give a biological application of ^{32}P isotope.
6. Mention the use of TEMED in SDS PAGE.
7. Which technique is used for the separation of DNA fragments.
8. What is the principle of lyophilization?

P.T.O.

9. What is disintegration constant?

10. Explain the principle of phase contrast microscope?

(10 × 1 = 10 Marks)

SECTION – B

Short Answer questions – Not to exceed one paragraph –
Answer any **Eight** questions.

11. Discuss on organic solvent extractions.

12. Give short note on the applications of ultra-centrifugation

13. Discuss on ion exchange resins.

14. Discuss about TLC and thin layer materials?

15. What is the importance of molar extinction coefficient?

16. What is rate zonal centrifugation.

17. Discuss on paper chromatography.

18. Outline the principle & resins of gel filtration chromatography.

19. What are the applications of reverse dialysis?

20. What is isoelectric focusing?

21. Discuss on absorption spectroscopy.

22. List any two applications of radioactive isotopes in biological system.

23. Comment on flame photometer.

24. What is PAGE?

25. Discuss on GM counter?

26. Discuss on different capillary columns used in GLC?

(8 × 2 = 16 Marks)

SECTION – C

Short essay questions – Not to exceed 120 words – Answer any **Six** questions.

27. Briefly explain instrumentation & different types of HPLC?

28. Discuss the principle and applications of liquid scintillation counter?

29. Discuss on adsorption chromatograghy?

30. Discuss on tissue homogenization methods.

31. Discuss on different techniques used in radioactivity?

32. Give an account of flow cytometry?

33. Discuss the biological hazards of radiation?

34. Briefly explain colorimeter and its principle?

35. Discuss on ion exchange chromatography?

36. Briefly explain density gradient centrifugation.

37. Briefly discuss on principle and application of GLC?

38. Explain the technique of affinity chromatography?

(6 × 4 = 24 Marks)

SECTION – D

Long essay – Answer any **Two** of the questions.

39. Write an essay on different techniques used in the purification of a protein?

40. Explain in detail the electro microscopes.

41. Explain an electrophoretic method used for the separation of a protein based on its molecular weight.

42. Write the principle, applications and instrumentation of spectrophotomer?

43. Discuss on the principle, procedure, applications and rotors used in ultracentrifugation?

44. Give a detailed account of the biological applications of radioactive isotopes.

(2 × 15 = 30 Marks)

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(Pages : 3) **N – 7869**

Reg. No. : .....

Name : .....

Fourth Semester B.Sc. Degree Examination, August 2022

First Degree Programme Under CBCSS

Biochemistry

Core Course III

BC 1441 TECHNIQUES IN BIOCHEMISTRY

(2020 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

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

1. Beer's law states that the intensity of light decreases with respect to _____
2. What is organic solvent?
3. What is absorbance?
4. Define Rf values.
5. Name any two 'tracking dye' used in SDS-PAGE of protein.
6. Expand HPLC and TLC.
7. Mention the uses of scintillation counter.
8. Explain radioisotopes and examples.
9. Expand RCF.
10. Mention the counting gas used in Geiger muller counter.

(10 × 1 = 10 Marks)

SECTION – B

Answer any **eight** questions. **Each** carries **2** marks.

11. Write the brief note on dialysis.
12. Define freeze thaw cycle"?
13. What is the principle of sonicator?

14. What is the main use of column chromatography?
15. Write the principle and applications of rate zonal centrifugation?
16. Define isoelectric focusing.
17. What is electrophoresis?
18. Explain fixed-angle rotors?
19. Comment on ultrafiltration.
20. Explain the two types of centrifugations.
21. Define neutron emission.
22. What is the unit of radioactivity?
23. Define Swing bucket rotor.
24. What is sedimentation rate in centrifugation?
25. Define half-life.
26. Comment on autoradiography.

(8 × 2 = 16 Marks)

SECTION – C

Answer any **six** questions. **Each** question carries **4** marks.

27. Briefly explain instrumentation and applications of colorimeter.
28. Explain flame photometer and its applications.
29. Explain high-pressure homogenizer and its applications.
30. Define lyophilization.
31. Outline the principle and applications of SDS-PAGE.
32. Explain the principle of Chromatography.
33. Write a short note on Adsorption chromatography.
34. Briefly explain Swinging-Bucket Rotors.
35. Write a brief note on paper electrophoresis.
36. Explain Svedberg constant?
37. Discuss biological applications of radioisotopes.
38. Discuss the safety measures in handling radioisotopes.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions. **Each** question carries **15** marks.

39. Explain in detail about instrumentation and application of the spectrophotometer.
40. What is homogenization? Explain in detail Sonicator, High pressure homogenizer.
41. Describe the principle, procedure and applications of HPLC?
42. Explain Agarose electrophoresis and its applications?
43. Write about Density gradient centrifugation and its applications?
44. Write a note on GM-Counter.

(2 × 15 = 30 Marks)

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(Pages : 4) **N – 7870**

Reg. No. : .....

Name : .....

Fourth Semester B.Sc. Degree Examination, August 2022

First Degree Programme Under CBCSS

Chemistry

Complementary Course for Biochemistry

CH 1431.6 : ORGANIC CHEMISTRY AND SPECTROSCOPY II

(2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** (Answer in one word/sentence)

1. What is eluent?
2. What is iodine value?
3. What are nylons?
4. What are essential oils?
5. Write any two factors affecting adsorption?
6. What is osmosis?
7. What is a gel?
8. Mention dispersed phase and dispersion medium in Fog?

P.T.O.

9. What is the standard used in NMR?

10. Name one lipid?

(10 × 1 = 10 Marks)

SECTION – B

Answer **any** eight, **Each** question carries 2 marks (Short Answer type)

11. Define Rf value?

12. Write any two applications of column chromatography?

13. What is DNA and what are the bases present in them?

14. What are phospholipids?

15. What are thermo plastics?

16. What are the monomers used for the preparation of BUNA-S?

17. What is Vulcanisation?

18. What are isotonic solutions give example?

19. What are terpenes?

20. What is tyndal effect?

21. What are the applications of colloids in the field of medicine?

22. What are detergents?

23. Define spin-spin coupling?

24. What is chemical shift?

25. Define Stratification value

26. What is the basic Principle of Raman spectroscopy?

(8 × 2 = 16 Marks)

SECTION – C

Answer **any six**, **Each** question carries 4 marks (Short essay)

27. Write a brief note on column chromatography?

28. Explain the hydrolysis of nucleoproteins?

29. Explain the classification of lipids?

30. Explain the structure of rubber?

31. Explain the method of preparation of Bakelite?

32. What are the difference between chemisorption and physisorption?

33. Explain Hardy-Schulz rule with example?

34. Explain the principle behind Delta formation?

35. Explain electrophoresis?

36. Define Mutual exclusion principle?

37. Why Raman spectrum is complementary to IR?

38. Write any four advantages of Raman spectroscopy?

(6 × 4 = 24 Marks)

SECTION – D

Answer **any Two**, **Each** question carries 15 marks (essay)

39. Explain gas chromatography and what are its applications?

40. Explain the structure of nucleic acids and explain their biological roles?

41. Explain addition and condensation polymerisation with example?

42. Explain Langmuir theory of adsorption?

43. Explain electroosmosis, sedimentation and streaming potentials of colloids?

44. Explain the principle and applications of NMR?

($2 \times 15 = 30$ Marks)

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(Pages : 4) **N – 7871**

Reg. No. : .....

Name : .....

Fourth Semester B.Sc. Degree Examination, August 2022

First Degree Programme under CBCSS

Chemistry

Complementary Course for Biochemistry

CH 1431.6 : ORGANIC CHEMISTRY AND SPECTROSCOPY

(2020 Admission)

Time : 3 Hours Max. Marks : 80

SECTION A

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

1. Define Essential Elements with suitable examples.
2. What is an Organometallic Compound? Give any two examples.
3. Define Steric Effect.
4. What is the metal part present in chlorophyll?
5. What are necessary conditions for a molecule to be optically active?
6. Define Iodine Value.
7. What is ESR Spectroscopy?
8. Define Rayleigh scattering and Rayleigh lines.
9. Selection rule for Rotational Raman Spectra.
10. NMR frequency lies in which region.

(10 × 1 = 10 Marks)

P.T.O.

SECTION B

Answer **any eight** questions. Each Question carries **2** marks.

11. What are the information that we are getting from NMR Spectra?

12. Discuss the importance of Morphine.

13. Differentiate enantiomers and diastereomers.

14. What is chemical Shift? Write the expression for calculating chemical shift.

15. Write any four applications of NMR.

16. State rule of mutual exclusion.

17. What are Stokes lines and Anti-stokes lines?

18. What is Carbon Cycle?

19. What are the classifications of an organometallic compound?

20. Explain Saponification Value and Acid Value.

21. Define racemic mixture.

22. Write any two organosilicon compounds used in medicines.

23. What are Cytochromes?

24. Explain the preparation of nickel carbonyls.

25. Draw the structure of thiophene and furan.

26. How many protons are there in $CH_3–CH_2–Cl$?

($8 \times 2 = 16$ Marks)

SECTION C

Answer **any six** questions. Each Question carries **4** marks.

27. Explain structure and bonding in Ziesel's salt.

28. Distinguish fats and oils.

29. Discuss optical isomerism in tartaric acid.

30. Write a note on relative and absolute configuration.

31. Discuss the role of haemoglobin and myoglobin O_2 – CO_2 transportation with mechanism.

32. Illustrate the directive influence of $–NO_2$ group in electrophilic aromatic substitution.

33. Explain in detail inductive effect.

34. Explain electrophilic substitution reactions of Furan.

35. Write any four advantages of Raman spectrum.

36. Briefly explain spin – spin Coupling.

37. Calculate the NMR frequency of the proton in a magnetic field of intensity 1.4092 T. (gN = 5.585, μN = $5.05 \times 10^{-27} JT^{-1}$).

38. Determine Rand S Notation for meso tartaric acid and L-glyceraldehyde.

($6 \times 4 = 24$ Marks).

SECTION D

Answer **any two** questions. Each question carries **15** marks.

39. (a) What is Resolution? Explain the methods for resolution. **7**

    (b) What are meso compounds? Explain with a suitable example. **4**

    (c) Discuss conformational analysis of butane. **4**

40. (a) What is Grignard reagent? How is it prepared? **4**

(b) How Grignard reagent is useful in the synthesis of primary, secondary, tertiary alcohols. **5**

(c) Explain nitrogen fixation. **6**

41. (a) How can the NMR method be used to distinguish between the structures of 1-propanol and 2-propanol? **4**

(b) What is the solvent used in NMR and mention its features? **4**

(c) Explain shielding effect and dishielding effect. **4**

(d) Write a note on theory of NMR. **3**

42. (a) Write the structure of purine and pyramidine bases. **4**

(b) Explain nucleophilic and electrophilic substitution reactions in pyramidine. **6**

(c) Why furan undergoes electrophilic substitution at 3- positions. **5**

43. (a) Explain the quantum theory of raman spectrum. **8**

(b) What are applications of ESR spectroscopy? **3**

(c) Explain hyperconjugative effect and mesomeric effect. **4**

44. (a) Discuss the mechanism of S_N1 and S_N2 reactions. **6**

(b) Effect of structure of alkyl group on S_N1 and S_N2 reactions. **5**

(c) What is Friedel-Crafts alkylation and acylation? **4**

($2 \times 15 = 30$ Marks)

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(Pages : 3) **M – 1628**

Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2021

First Degree Programme under CBCSS

Bio Chemistry

Core Course V

BC 1541 : PHYSIOLOGY AND IMMUNOLOGY

(2014, 2016-2017 Admission)

Time : 3 Hours Max. Marks : 80

PART – A

Answer the following questions in a word or in **one** or **two** sentences. Each question carries **1** mark.

1. What do you mean by major histocompatibility complex?

2. Name any two proteins of striated muscles.

3. What are T3 and T4?

4. Give two examples of endocrine hormones.

5. Define action potential.

6. What is hybridoma technology?

7. Mention an example each of a natural anticoagulant and artificial anticoagulant.

P.T.O.

8. What are Nodes of Ranvier?

9. Indicate any two substances in whole blood which affects oxygen binding properties of hemoglobin.

10. What is humoral immunity?

(10 × 1 = 10 Marks)

PART – B

Write a paragraph on **any eight** of the following. Each question carries **2** marks.

11. What are immunoglobulins? Give the different classes of immunoglobulins?

12. Name two hormones each of adrenal cortex and adrenal medulla.

13. What is RIA? Name the scientist who developed the technique of RIA.

14. What is the biological “electrical insulating tape” wrapped around axons?

15. What are thick filaments?

16. Which are the two main types of bone cells? Give their functions.

17. What is the basis of precipitation reactions involving immunoglobulins?

18. What is Addison's disease? What are the causes?

19. Comment on lgG.

20. Give the significance of bicarbonate buffer system.

21. What is the contribution of Gerald Edelman and Rodney Porter in Immunology?

22. Mention the applications of ELISA.

(8 × 2 = 16 Marks)

PART – C

Short essays not exceeding **120** words. Answer **any six** questions. Each question carries **4** marks.

23. Discuss Bohr effect.

24. Briefly explain the classification of blood groups.

25. Explain the principle and methodology of ELISA.

26. Explain the posterior pituitary hormones.

27. Illustrate hybridoma technology.

28. Describe the propagation of nerve impulses.

29. Discuss the cell types of lymphoreticular system.

30. Explain the structure of immunoglobulins with suitable diagram.

31. Briefly explain hypothyroidism.

(6 × 4 = 24 Marks)

PART – D

Long essays Answer **any two** questions. Each question carries **15** marks.

32. Describe the lymphoid system in detail.

33. Explain the principle, methodology and applications of RIA.

34. Elaborate the various plasma proteins and their functions.

35. Explain the structure of muscle and muscle contraction.

(2 × 15 = 30 Marks)

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(Pages : 4) **M – 1629**

Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2021

First Degree Programme under CBCSS

BIOCHEMISTRY

Core Course VI

BC 1542 : BIOENERGETICS AND CARBOHYDRATE METABOLISM

(2014, 2016 -2017 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer the following questions in a word or in **one** or **two** sentences. **Each** question carries **1** mark.

1. What is meant by standard reduction potential?
2. What do you mean by a reducing agent?
3. What is a radioactive tracer?
4. Write down the reaction catalysed by LDH, with structural formulae.
5. What is meant by intermediary metabolism?
6. Which hepatic enzyme is defective in essential fructosuria?
7. Mention any one significance of HMP shunt.
8. What are uncouplers?

P.T.O.

9. Where is ATP synthase located in the cell?

10. Define P/O ratio.

(10 × 1 = 10 Marks)

SECTION – B

Write a paragraph on any **eight** of the following. **Each** question carries **2** marks.

11. Draw the structures of two energy rich compounds in the living system, highlighting the high energy bonds.

12. Explain the use of mutants in studying metabolic pathways.

13. What is meant by Gibbs free energy? How is it related to feasibility of reactions?

14. Write a note on the energy consuming phase of glycolysis.

15. What are anaplerotic reactions? Give an example.

16. How does maltose enter into glycolytic pathway?

17. What are the irreversible steps of TCA cycle?

18. Write a note on McArdle disease.

19. Explain the role of UDP-galactose-4 epimerase in carbohydrate metabolism.

20. What are electron carriers? Give two examples from the mitochondrial electron transport chain.

21. Mention the names of two inhibitors of electron transport chain. How do they act?

22. What is F_1F_0 ATPase?

(8 × 2 = 16 Marks)

SECTION – C

Short essay not exceeding 120 words. Answer any **six** questions. **Each** question carries **4** marks.

23. Why hydrolysis of ATP is associated with a more negative value of change in free energy compared to the hydrolysis of other phosphorylated compounds.

24. Discuss the role of oxidation-reduction reactions in bioenergetics.

25. Write a note on different experimental approaches in studying metabolism.

26. Explain how the glycolytic pathway is regulated.

27. Describe glyoxilate cycle? Explain its importance in plants.

28. Describe the role of pyruvate dehydrogenase in carbohydrate metabolism.

29. Write a note on glycogenesis. How is it regulated?

30. Write a note on the composition of the protein complexes of electron transport chain.

31. Write a note on chemiosmosis.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions. **Each** question carries **15** marks.

32. Give an account of the sequential reactions involved in gluconeogenesis. How is it regulated?

33. Write an essay on glycogen metabolism and its regulation.

34. Write a note on the inborn errors of carbohydrate metabolism.

35. Outline the transport of electrons through the mitochondrial electron transport chain. Explain the mechanism of ATP production by oxidative phosphorylation.

($2 \times 15 = 30$ Marks)

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(Pages : 3) **M – 1630**

Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2021

First Degree Programme under CBCSS

Biochemistry

Core Course VII

BC 1543 : ANALYTICAL BIOCHEMISTRY

(2014, 2016 - 2017 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer the following questions in a word or in one or **two** sentences. **Each** question carries **1** mark.

1. Which vitamin is essential for blood cloning?
2. What is the calorific value of fat?
3. Name two essential fatty acids?
4. Name an emulsifier.
5. Define COD.
6. Which mineral element is required for the formation of thyroid hormone?
7. Name the carbohydrate present in milk.
8. Which vitamin acts as a natural antioxidant.

P.T.O.

9. Name the metal present in vitamin B12.

10. How can you detect fecal contamination in water?

(10 × 1 = 10 Marks)

SECTION – B

Write a paragraph on any **eight** of the following. **Each** question carries **2** mark.

11. Lactose intolerance

12. Functions of vitamin C

13. BMR

14. Functions of carbohydrates in our body

15. Nutritional importance of egg

16. MSG (Monosodium glutamate)

17. Permitted colours

18. Artificial sweeteners

19. Lead poisoning

20. Lipases

21. Action of alcohol on our body

22. Toxicity of carbon monoxide

(8 × 2 = 16 Marks)

SECTION – C

Short essay not exceeding 120 words.Answer any **six** of the following. **Each** question carries **4** marks.

23. Digestion and absorption of fat.

24. Functions and deficiency diseases of folic acid and thiamin.

25. Production of wine.

26. Composition and importance of fish.

27. Determination of moisture and fat contents in food.

28. Food additives.

29. Food adulteration.

30. Production of yogurt.

31. Composition of bile.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** of the following. **Each** question carries **15** marks.

32. Discuss the role of enzymes in the digestion of proteins. Also make a note on absorption of amino acids.

33. Describe the toxic action of heavy metals.

34. Explain the analysis of nutrients in food

35. Give an account of food additives.

(2 × 15 = 30 Marks)

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(Pages : 3) **M – 1631**

Reg. No. : .....

Name : .....

FIFTH Semester B.Sc. Degree Examination, December 2021

First Degree Programme under CBCSS

Biochemistry

Core Course VIII

BC 1544 : CLASSICAL AND MOLECULAR GENETICS

(2014, 2016- 2017 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer the following questions in a word to a maximum of **two** sentences. **Each** question carries **1** mark.

1. The genetic constitution of an organism is called ——————————

2. Chromosomal mutation in which part of a chromosome missing is ——————————

3. SSB proteins are ——————————

4. Name the enzyme involved in RNA synthesis from DNA

5. Jumping genes are called ——————————

6. The tendency of offspring to differ from its parent is ——————————

7. Trisomy at the 21st chromosome leads to ——————————

8. Color blindness is due to ——————————

P.T.O.

9. Rediscoverers of Mendelism are ————————————

10. Define Backcross.

(10 × 1 = 10 Marks)

SECTION – B

Answer in a paragraph on any **eight** questions. **Each** question carries **2** marks.

11. What is Shine Dalgarno sequence?

12. What are YAC vectors?

13. Comment on the degeneracy of genetic code.

14. Define inversion.

15. What is a genomic library?

16. Define penetrance.

17. Write short notes transposons.

18. Identify the action of helicases.

19. What are Okazaki fragments?

20. State the role of the rho factor?

21. What are the restriction endonucleases? Give examples.

22. What are histones and write about its importance ?

(8 × 2 = 16 Marks)

SECTION – C

Short essay not exceeding 120 words. Answer any **six** of the following. **Each** question carries **4** marks.

23. Describe different types of mutations.

24. Differentiate deletion, translocation, and inversion.

25. State different inhibitors of translation with its mode of action.

26. Illustrate the process of DNA fingerprinting.

27. What are mutagens and their types?

28. Discuss the proteins involved in prokaryotic DNA replication.

29. Elaborate the organization of chromatin.

30. Distinguish co-dominance and incomplete dominance with examples

31. Outline trp operon

(6 × 4 = 24 Marks)

SECTION – D

Long essay questions. Answer any **two** questions. **Each** question carries **15** marks.

32. Differentiate conjugation, transformation, and transduction in bacteria

33. Outline DNA repair mechanisms.

34. Explain prokaryotic transcription

35. Illustrate different steps in recombinant DNA technology

(2× 15 = 30 Marks)

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(Pages : 4) **M – 1634**

Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2021

First Degree Programme under CBCSS

Biochemistry

Core Course V

BC 1541 : PHYSIOLOGY AND IMMUNOLOGY

(2018 and 2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer the following questions in a word or in one or two sentences. Each question carries **1** mark.

1. What do you mean by major histocompatibility complex?

2. Name any two proteins of striated muscles.

3. What are T3 and T4?

4. Give two examples of endocrine hormones.

5. Define action potential.

6. What is hybridoma technology?

7. Mention an example each of a natural anticoagulant and artificial anticoagulant.

8. What are Nodes of Ranvier?

P.T.O.

9. Indicate any two substances in whole blood which affects oxygen binding properties of hemoglobin?

10. What is humoral immunity?

(10 × 1 = 10 Marks)

SECTION – B

Write a paragraph on any **eight** of the following. Each question carries **2** marks.

11. What are immunoglobulins? Give the different classes of immunoglobulins?

12. Name two hormones each of adrenal cortex and adrenal medulla.

13. What is RIA? Name the scientist who developed the technique of RIA.

14. What is the biological “electrical insulating tape” wrapped around axons?

15. What are thick filaments?

16. Which are the two main types of bone cells? Give their functions.

17. What is the basis of precipitation reactions involving immunoglobulins?

18. What is Addison’s disease? What are the causes?

19. Comment on lgG.

20. Give the significance of bicarbonate buffer system.

21. What is the contribution of Gerald Edelman and Rodney Porter in Immunology?

22. Mention the applications of ELISA.

23. Describe the functions of glial cells.

24. Explain the structure of striated muscle.

25. What is meant by refractory period?

26. Explain respiratory acidosis.

(8 × 2 = 16 Marks)

SECTION – C

Short essays not exceeding **120** words. Answer any **six** questions. Each question carries **4** marks.

27. Discuss Bohr effect.

28. Briefly explain the classification of blood groups.

29. Explain the principle and methodology of ELISA.

30. Explain the posterior pituitary hormones.

31. Illustrate hybridoma technology.

32. Describe the propagation of nerve impulses.

33. Discuss the cell types of lymphoreticular system.

34. Explain the structure of immunoglobulins with suitable diagram.

35. Briefly explain hypothyroidism.

36. Explain phosphate buffer system

37. Give a detailed account of neurotransmitter

38. Give an account of T3 and T4.

($6 \times 4 = 24$ Marks)

SECTION – D

Long essay.

Answer any **two** questions. Each question carries **15** marks.

39. Describe the lymphoid system in detail.

40. Explain the principle, methodology and applications of RIA.

41. Elaborate the various plasma proteins and their functions.

42. Explain the structure of muscle and muscle contraction.

43. Give a detailed account of adrenal hormones.

44. Describe the production of monoclonal antibodies. Elaborate their uses in research and diagnosis.

(2 × 15 = 30 Marks)

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(Pages : 4) **M – 1635**

Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2021

First Degree Programme under CBCSS

Biochemistry

Core Course

BC 1542 : BIOENERGETICS AND CARBOHYDRATE METABOLISM

(2018 & 2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer the following questions in a **word** or in **one** or **two** sentences. Each question carries **1** mark.

1. What is meant by standard reduction potential?

2. What do you mean by a reducing agent?

3. What is a radioactive tracer?

4. Write down the reaction catalysed by LDH, with structural formulae.

5. What is meant by intermediary metabolism?

6. Which hepatic enzyme is defective in essential fructosuria?

7. Mention any one significance of HMP shunt.

P.T.O.

8. What are uncouplers?

9. Where does ATP synthase located in the cell?

10. Define P/O ratio.

(10 × 1 = 10 Marks)

SECTION – B

Write a paragraph on any **eight** of the following. Each question carries **2** marks.

11. Draw the structures of two energy rich compounds in the living system, highlighting the high energy bonds.

12. Explain the use of mutants in studying metabolic pathways.

13. What is meant by Gibbs free energy? How is it related to feasibility of reactions?

14. Write a note on the energy consuming phase of glycolysis.

15. What are anaplerotic reactions? Give an example.

16. How does maltose enter into glycolytic pathway?

17. What are the irreversible steps of TCA cycle?

18. Write a note on McArdle disease.

19. Explain the role of UDP-galactose-4 epimerase in carboydrate metabolism.

20. What are electron carriers? Give two examples from the mitochondrial electron transport chain.

21. Mention the names of two inhibitors of electron transport chain, how do they act?

22. What is F_1F_0 ATPase?

23. What are the parameters on which free energy change of a reaction depend on?

24. Outline glucose alanine cycle and its significance.

25. What is meant by inborn errors in metabolism? Give an example.

26. Describe the significance of glucose transporters in carbohydrate metabolism.

(8 × 2 = 16 Marks)

SECTION – C

Short essay not exceeding **120** words. Answer any **six** questions. Each question carries **4** marks.

27. Why hydrolysis of ATP is associated with a more negative value of change in free energy compared to the hydrolysis of other phosphorylated compounds?

28. Discuss the role of oxidation-reduction reactions in bioenergetics.

29. Write a note on different experimental approaches in studying metabolism.

30. Explain how the glycolytic pathway is regulated.

31. Describe glyoxylate cycle? Explain its importance in plants.

32. Describe the role of pyruvate dehydrogenase in carbohydrate metabolism.

33. Write a note on glycogenesis. How is it regulated?

34. Write a note on the composition of the protein complexes of electron transport chain.

35. Write a note on chemiosmosis.

36. Differentiate between aerobic and anaerobic glycolysis.

37. Explain the structure of mitochondria.

38. What is meant by reducing potentials? Give two examples and list out their importance in bioenergetics.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions. Each question carries **15** marks.

39. Give an account of the sequential reactions involved in gluconeogenesis. How is it regulated?

40. Write an essay on glycogen metabolism and its regulation.

41. Write a note on the inborn errors of carbohydrate metabolism.

42. Outline the transport of electrons through the mitochondrial electron transport chain. Explain the mechanism of ATP production by oxidative phosphorylation.

43. Explain the concepts of free energy, standard free energy change and actual free energy change of chemical reactions, with suitable examples.

44. Compare TCA cycle and glyoxylate cycle.

($2 \times 15 = 30$ Marks)

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(Pages : 4) **M – 1636**

Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2021

First Degree Programme under CBCSS

Biochemistry

Core Course

BC 1543 : ANALYTICAL BIOCHEMISTRY

(2018 and 2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer the following questions in a word or in **one** or **two** sentences. Each question carries **1** mark.

1. Which vitamin is essential for blood clotting?
2. What is the calorific value of fat?
3. Name two essential fatty acids?
4. Name an emulsifier
5. Define COD.
6. Which mineral element is required for the formation of thyroid hormone?
7. Name the carbohydrate present in milk.
8. Which vitamin acts as a natural antioxidant?
9. Name the metal present in vitamin B12.
10. How can you detect fecal contamination in water?

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

Write a paragraph on any **eight** of the following. Each question carries **2** marks.

11. Lactose intolerance
12. Functions of vitamin C
13. BMR
14. Functions of carbohydrates in our body
15. Nutritional importance of egg
16. MSG
17. Permitted colours
18. Artificial sweeteners
19. Lead poisoning
20. Glycemic index
21. Action of alcohol on our body
22. Essential amino acids.
23. Lipases
24. Honey
25. Cheese
26. Toxicity of carbon monoxide

(8 × 2 = 16 Marks)

SECTION – C

(Short Essay)

Short essay not exceeding **120** words. Answer any **six** of the following. Each question carries **4** marks.

27. Digestion and absorption of fat.

28. Functions and deficiency diseases of folic acid and thiamin

29. Production of wine

30. Composition and importance of fish.

31. Determination of moisture and fat contents in food

32. Fat soluble vitamins and their functions

33. Food spoilage

34. Food adulteration

35. Estimation of saccharin in food.

36. Production of yogurt.

37. Composition of bile

38. Absorption of iron

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** of the following. Each question carries **15** marks.

39. Give an account of functions and deficiency diseases of fat soluble vitamins.

40. Discuss the role of enzymes in the digestion of proteins. Also make a note on absorption of amino acids.

41. Discuss the functions of mineral elements in our body.

42. Describe the toxic action of heavy metals.

43. Explain the analysis of nutrients in food

44. Give an account of food additives.

(2 × 15 = 30 Marks)

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(Pages : 4) **M – 1637**

Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2021

First Degree Programme under CBCSS

Biochemistry

Core Course

BC 1544 : CLASSICAL AND MOLECULAR GENETICS

(2018 and 2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer the following questions in a word to a maximum of two sentences. Each question carries **1** mark.

1. The genetic constitution of an organism is called ——————.
2. Chromosomal mutation in which part of a chromosome missing is ——————.
3. SSB proteins are ——————.
4. Name the enzyme involved in RNA synthesis from DNA.
5. Jumping genes are called ——————.
6. The tendency of offspring to differ from its parent is ——————.
7. Trisomy at the 21st chromosome leads to ——————.

8. Color blindness is due to ——————.

9. Rediscoverers of Mendelism are ——————.

10. Define Backcross.

(10 × 1 = 10 Marks)

SECTION – B

Answer in a paragraph on **any eight** questions. Each question carries **2** marks.

11. What is Shine Dalgarno sequence?

12. What are YAC vectors?

13. Comment on the degeneracy of genetic code.

14. Define inversion.

15. What is a genomic library?

16. Define penetrance.

17. Write short notes transposons.

18. Identify the action of helicases.

19. What are Okazaki fragments?

20. State the role of the rho factor.

21. What are the restriction endonucleases? Give examples.

22. What are histones and write about its importance?

23. Define plasmids and discuss their functions.

24. Write short notes on reverse transcription.

25. What is Genomic imprinting?

26. Write about the promoter sequence in prokaryotes.

(8 × 2 = 16 Marks)

SECTION – C

Short essay not exceeding **120** words. Answer **any six** of the following. Each question carries **4** marks.

27. Describe different types of mutations.

28. Differentiate deletion, translocation, and inversion.

29. State different inhibitors of translation with its mode of action.

30. Illustrate the process of DNA fingerprinting.

31. What are mutagens and their types?

32. Discuss the proteins involved in prokaryotic DNA replication.

33. Elaborate the organization of chromatin.

34. Distinguish co-dominance and incomplete dominance with examples.

35. Outline trp operon.

36. State different post transcriptional modifications.

37. Illustrate X-linked inheritance in *Drosophila melanogaster*.

38. Differentiate constitutive and inducible enzymes.

(6 × 4 = 24 Marks)

SECTION – D

Long essay questions. Answer **any two** questions. Each question carries **15** marks.

39. Differentiate conjugation, transformation and transduction in bacteria.

40. Outline DNA repair mechanisms.

41. Explain prokaryotic transcription.

42. Illustrate different steps in recombinant DNA technology.

43. Describe Lac operon.

44. What is pedigree analysis and state its applications?

(2 × 15 = 30 Marks)

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(Pages : 3) **P – 2662**

Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2022

First Degree Programme under CBCSS

BIOCHEMISTRY

Core Course V

BC 1541 – PHYSIOLOGY AND IMMUNOLOGY

(2013 - 2017 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer the following questions in a word or in one or two sentences.
Each question carries **1** mark.

1. Platelets

2. Red cell antigens

3. What is the partial pressure of CO_2 in the venous blood?

4. What are blood buffers?

5. Name the two filaments in skeletal muscle fiber.

6. What is a Glial cell?

P.T.O.

7. What is the site of biosynthesis of cortisol?

8. What is anaphylaxis?

9. Immunoglobulin consists of _____ and _____ regions.

10. What is 'RIA'?

(10 × 1 = 10 Marks)

SECTION – B

Write a paragraph on any **eight** of the following. Each question carries **2** marks.

11. Bleeding time

12. Leucopoiesis

13. Methemoglobin

14. Bile acids

15. Hill plot

16. Norepinephrine

17. Cholecalciferol

18. All or none response

19. Chemical synapses

20. MHC antigens

21. Phagocytosis

22. Immunodiffusion

(8 × 2 = 16 Marks)

SECTION – C

Write short essays not exceeding **120** words. Answer any **six** of the following.
Each question carries **4** marks.

23. Write note on erythropiesis.

24. Blood coagulation

25. Exchange of gases in alveoli and tissues.

26. Ionic basis of action potential.

27. Excitatory chemical synapses.

28. Write note on thyroid hormones.

29. Primary and secondary immune responses.

30. Clonal selection of lymphocytes.

31. ELISA.

(6 × 4 = 24 Marks)

SECTION – D

Write long essay. Answer any **two** of the following.
Each question carries **15** marks.

32. Discuss blood group systems and their significance in blood transfusion.

33. Discuss the transport of CO_2 in blood from tissues.

34. Describe structure, classification and functions of immunoglobulins.

35. How do you produce monoclonal antibodies? Describe briefly its uses in diagnosis and therapy.

(2 × 15 = 30 Marks)

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(Pages : 4) **P – 2663**

Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2022

First Degree Programme under CBCSS

Biochemistry

Core Course VI

BC 1542 – BIOENERGETICS AND CARBOHYDRATE METABOLISM

(2013 – 2017 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer the following questions in a word or in **one** or **two** sentences. Each question carries **1** mark.

1. Differentiate exergonic and endergonic reactions.

2. Name the storage form of High energy in vertebrates.

3. Define the term ‘Amphibolism’.

4. How many ATP are produced in glycolysis under anaerobic condition?

5. What is fructosuria?

6. Mention the key enzymes of glyoxylate cycle.

P.T.O.

7. Which enzyme determines whether the tissue is capable of contributing glucose to blood?

8. Why does glucagon stimulate glycogen breakdown in liver but not in muscle?

9. Mention the location of ETC.

10. Which enzyme in TCA cycle catalyses substrate level phosphorylation?

(10 × 1 = 10 Marks)

SECTION – B

Write a paragraph on any **eight** of the following. Each question carries **2** marks:

11. What is meant by positive and negative free energy?

12. Write the structure of ATP.

13. Comment on Tracer technique.

14. Explain the term 'Anaplerosis'.

15. What is Lactose intolerance?

16. Name the vitamins required by pyruvate dehydrogenase.

17. Mention the rule of cyclic AMP in glycogen metabolism.

18. What is Cori cycle?

19. What characteristics do ubiquinone and cytochrome C have in common?

20. How many ATP will be produced when one molecule of NADH and $FADH_2$ enter the ETC and get oxidised?

21. Name any two inhibitors of ETC.

22. What is P/O ratio?

(8 × 2 = 16 Marks)

SECTION – C

Short essay not exceeding 120 words. Answer any **six** of the following. Each question carries **4** marks.

23. Write about the classification of high energy compounds with examples.

24. Explain how metabolic inhibitors are used to elucidate the metabolic pathway.

25. Write the oxidative decarboxylation reactions of TCA cycle.

26. How does gluconeogenic pathway circumvent the irreversible reactions of glycolytic pathway?

27. Write a short note on glycogen storage diseases.

28. Distinguish between uncouplers and inhibitors of ETC.

29. Give the substrate level phosphorylation reactions of glycolytic pathway.

30. Explain the hypothesis of mitochondrial oxidative phosphorylation.

31. Highlights on glycerol-3-phosphate shuttle for the transport of reducing potentials into mitochondria.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** of the following. Each question carries **15** marks.

32. Describe the elucidation of metabolic pathways by using:

    (a) Whole organism

    (b) Tissue slices

    (c) Isotopes

33. Enumerate the reactions of HMP Shunt.

34. Give an account of Glycogen metabolism.

35. Discuss ETC under the following headings:

    (a) Various Components

    (b) Site of ATP formation and

    (c) Inhibitors

(2 × 15 = 30 Marks)

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(Pages : 3) **P – 2664**

Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2022

First Degree Programme under CBCSS

Biochemistry

Core Course VII

BC 1543 – ANALYTICAL BIOCHEMISTRY

(2013 - 2017 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer the following questions in a word or in **one** or **two** sentences.
Each question carries **1** mark.

1. Protein and energy deficiency leads to _____.

2. Deficiency of vitamin A leads to _____.

3. Generation time of *E. Coli* is _____ minute.

4. _____ radiation can be used for the disinfection of drinking water.

5. COD estimation requires _____ days incubation.

6. HTST abbreviation for _____.

P.T.O.

7. The elastic and springy nature of wheat flour dough is because of the presence of the protein _____.

8. Food poisoning caused mainly by _____.

9. Calorific value of glucose is _____.

10. Bile is essential for _____ digestion.

(10 × 1 = 10 Marks)

SECTION – B

Write a paragraph on any **eight** of the following. Each carries **2** marks.

11. What are food additives?

12. Write about pasteurization.

13. Explain BOD.

14. Write briefly on spices.

15. What is removal of microorganisms?

16. Distinguish molasses and jaggery.

17. Discuss the role of entero-hepatic circulation.

18. What are flavouring agents?

19. What are carbohydrates? Give two examples of carbohydrates present in food.

20. Write about the different types of fermentation.

21. Write about growth of microorganisms in meat.

22. Write about types of wine.

(8 × 2 = 16 Marks)

SECTION – C

Write short essays not exceeding 120 words. Answer any **six** of the following.
Each question carries **4** marks.

23. Write the digestion and of absorption of fat in GIT.

24. Write about production of vinegar.

25. What are saccharines? Give two examples.

26. Significance of bile secretion.

27. What are the different water soluble vitamins and their daily requirements.

28. Describe food adulteration.

29. Explain the sources and requirements of fat soluble vitamins.

30. Write a short note on arsenic and cyanide poisoning.

31. Write about types of food preservation.

(6 × 4 = 24 Marks)

SECTION – D

Write long essay. Answer any **two** of the following.
Each question carries **15** marks.

32. Describe digestion of proteins in various parts of GIT and their absorption.

33. Write an essay on the various food additives.

34. Describe the functions and deficiency disorders of fat soluble vitamins.

35. Write about contamination and spoilage of meat and meat products. How are they preserved?

(2 × 15 = 30 Marks)

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(Pages : 3) **P – 2665**

Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2022

First Degree Programme under CBCSS

Biochemistry

Core Course VIII

BC 1544 – CLASSICAL AND MOLECULAR GENETICS

(2013 - 2017 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Very short answer type, maximum two sentences. Answer **all** questions. Each question carries **1** mark.

1. The genotypic ratio in the F1 generation of monohybrid cross is _____?.
2. Name the process of synthesis of an RNA molecule from DNA template.
3. Define penetrance.
4. What is genomic imprinting?
5. Name the process of DNA transfer in bacteria that requires a virus.
6. What is replicon?

P.T.O.

7. Define allele.

8. What are exons?

9. Define backcross.

10. What is plasmid?

(10 × 1 = 10 Marks)

SECTION – B

Short answer questions not exceed one paragraph. Answer any **eight** questions.
Each question carries **2** marks.

11. What are cosmids?

12. What is an inversion?

13. What is the role of transposase?

14. Comment on photolyases.

15. Write a short note on the cDNA library.

16. Differentiate constitutive and inducible enzymes.

17. Define genetic anticipation.

18. The role of GATC sequence in DNA repair.

19. Define shine Dalgarno sequence.

20. What are termination codons?

21. What is restriction endonuclease? Give two examples with action.

22. Write notes on wobble hypothesis.

(8 × 2 = 16 Marks)

SECTION – C

Short essay not exceeding 120 words. Answer any **six** of the following.
Each question carries 4 marks.

23. Describe Griffith's experiments demonstrated transformation in bacteria.

24. Discuss on chromatin organization.

25. Discuss polyploidy and its significance.

26. Describe the epistasis gene interaction with example.

27. What is PCR? What are the steps of PCR reaction?

28. State different posttranscriptional modifications.

29. What are the different characteristics of genetic code?

30. Discuss different types of mutation.

31. Explain the pedigree analysis.

(6 × 4 = 24 Marks)

SECTION – D

Long essay questions. Answer any **two** questions. Each question carries 15 marks.

32. What is the operon concept? Illustrate the lac operon in *E.Coli.*

33. Describe the bacterial protein biosynthesis.

34. Elaborate the process of prokaryotic transcription.

35. Explain the principle and applications of DNA fingerprinting.

(2 × 15 = 30 Marks)

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(Pages : 4) **P – 2668**

Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2022

First Degree Programme under CBCSS

Biochemistry

Core Course V

BC 1541 – PHYSIOLOGY AND IMMUNOLOGY

(2018 - 2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. Very short answer type – Maximum **two** sentences.

1. What are the two types of plasma proteins?

2. How many subunits will be present in the Hemoglobin?

3. PO_2 is high in lung or in tissue?

4. In what form CO_2 transported form the tissue to the Lungs?

   (a) Dissolved in solution

   (b) Buffered with water as carbonic acid

   (c) Bound to proteins, particularly haemoglobin

5. What is the role of acid phosphatase?

6. Where is the hormone epinephrine and nor epinephrine produced in our body?

7. Where the insulin is produced in our body?

8. How will you define immunogen?

9. What is paratope?

10. Where is Fab present? **(10 × 1 = 10 Marks)**

SECTION – B

Answer any **eight** questions. Short answer questions – not to exceed **one** paragraph.

11. What is the role of TPA in clot degradation?

12. Define bleeding time.

13. Name the available blood groups in ABO system.

14. Discuss about the oxygen dissociation curve.

15. Name any four physiological differences observed during the metabolic acidosis and respiratory acidosis.

16. Outline the importance of hemoglobin buffer system of our body.

17. Name any four important neurotransmitters of our body.

18. What is the role of mineralocarticoids in our body?

19. Why heart muscles are called special muscles.

20. What is fight or flight mechanism? Why it is called so and which hormone is responsible for it?

21. Discuss about Hypogonadism.

22. What do you mean by opsonization?

23. Name the types of antibodies and its biological functions.

24. Name any two radio isotopes used in the RIA.

25. What is the difference between monoclonal and polyclonal antibodies?

26. Why the fluorescence chemicals are unstable in nature? **(8 × 2 = 16 Marks)**

SECTION – C

Answer any **six** questions. Short essay – not to exceed **120** words.

27. Discuss about the coagulation time and its clinical significance.

28. Discuss in detail about the erythropoeisis.

29. Discuss about Hill plot and its biological significance.

30. Explain about the unique nature of the enzyme carbonic unhydrase.

31. Discuss about the travel of action potential from the neuron to the neuromuscular junctions and explain how it passes the information to the muscle for muscle contraction.

32. Elaborate the role of vitamin D in box formation.

33. Discuss about the Estradiol disorders in women.

34. Discuss about the biological function of testosterones.

35. What is the role of mast cell in our immune system?

36. Draw the structure of the antibody and label it.

37. Explain the principle involved in immunodiffusion technique.

38. Explain the immunoflourescence technology and its major application with suitable example. **(6 × 4 = 24 Marks)**

SECTION – D

Answer any **two** questions. Long essay.

39. Give an extensive note on the different developmental stages associated with leukipoisis.

40. Discuss in detail about the

    (a) Buffers in the blood

    (b) Metabolic and respiratory alkalosis

    (c) Clinical conditions associated with metabolic and respiratory alkalosis

41. Discuss in detail about the rigor mortis muscle physiology with clear diagrams.

42. Discuss in detail about the primary and secondary immune response reaction that take place during the infection by any bacterium.

43. Discuss in detail about the production of monoclonal antibody by hybradoma technique.

44. Discuss in detail how our body is controlled by the endocrine system.

(2 × 15 = 30 Marks)

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2022

First Degree Programme under CBCSS

Biochemistry

Core Course VI

BC 1542 – BIOENERGETICS AND CARBOHYDRATE METABOLISM

(2018 - 2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer the following questions in a word or in **one** or **two** sentences.
Each question carries **1** mark.

1. Name the enzyme which catalyses rate committed step in glycolysis.

2. Which is primer molecule utilized in Glycogen synthesis?

3. What does the symbol ~ P denote?

4. Name the Cu containing complex in electron transport chain.

5. Name the disease associated with galactose metabolism.

6. What are the significant products of HMP pathway?

P.T.O.

7. Which reactions show negative ΔG?

8. What does P/O ratio indicate?

9. Among the following _____ is a substrate during gluconeogenesis.

   (a) Glucose (b) Glycogen (c) Glycerol (d) Starch

10. Net ATP production during glycolysis in anaerobic conditions.

(10 × 1 = 10 Marks)

SECTION – B

Write a paragraph on any **eight** of the following.
Each question carries **2** marks.

11. Briefly mention the reaction in TCA cycle which produces GTP. Mention the enzyme.

12. Mention two reactions where NADH is used.

13. Why TCA cycle is an anapleurotic reaction?

14. Mention the difference between inhibitors and uncouplers in glucose metabolism.

15. How does glycolysis differ from gluconeogenesis?

16. Write a short note on fructose metabolism disorders.

17. Explain the significance of Cori cycle.

18. Give the structure of mitochondria.

19. Write a short note on Succinate dehydrogenase.

20. Mention on the complex I and inhibitors affecting complex I on the electron transport chain.

21. What do you mean by substrate level phosphorylation? Give any example.

22. Define standard free energy change.

23. Distinguish between catabolism and anabolism.

24. What is tracer technique?

25. Distinguish between hexokinase and glucokinase.

26. Briefly explain glyoxylate cycle.

(8 × 2 = 16 Marks)

SECTION – C

Short essay questions. Answer any **six** of the following.
Each question carries **4** marks.

27. Discuss briefly on glycogenesis.

28. Explain whole organism studies.

29. Discuss on the steps involved in glycogenolysis.

30. Explain how NADH is transported to mitochondria.

31. Discuss on any four inborn errors of metabolism.

32. Discuss on the fate of glucose 6 phosphate in carbohydrate metabolism.

33. What are high energy compounds? Briefly explain any four.

34. Discuss on fructose metabolism in liver.

35. Explain Cori cycle.

36. How TCA cycle plays an amphibolic role in metabolism?

37. Discuss on glycogen storage diseases.

38. Write an essay on various approaches to study metabolism.

(6 × 4 = 24 Marks)

SECTION – D

Long Essay

Answer any **two** of the following. Each question carries **15** marks.

39. Explain the reactions of TCA cycle and the calculation of energy yield as ATP in aerobic and anaerobic oxidation of carbohydrates.

40. Explain the oxidation of glucose in HMP shunt.

41. Discuss on chemiosmotic hypothesis and electron transport chain.

42. Discuss the regulation of glycogen metabolism.

43. Explain the reactions of pyruvate dehydrogenase complex and the fate of pyruvate in metabolism.

44. Explain glycosis and its regulation.

(2 × 15 = 30 Marks)

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2022

First Degree Programme Under CBCSS

Biochemistry

Core Course VII

BC 1543 : ANALYTICAL BIOCHEMISTRY

(2018 and 2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions in **one** word or maximum **2** sentences; each question carries **1** mark.

1. What are zymogens? Give two examples.
2. What is the function of bile?
3. What is calorific value?
4. What are essential amino acids?
5. Name two pulses.
6. Name the disease caused by Mercury pollution.
7. Name a flavouring agent.
8. What are emulsifying agents?

P.T.O.

9. Name two fermented dairy products

10. Why is carbon monoxide toxic?

(10 × 1 = 10 Marks)

SECTION – B

Write a paragraph each on **any eight** of the following. Each question carries **2** marks.

11. Enzymes involved in protein digestion.

12. Composition of bile.

13. Functions of vitamin C.

14. BMR.

15. Functions of fat.

16. Vitamin A deficiency diseases.

17. Nutritional importance of fish.

18. Analysis of moisture in food.

19. Soft drinks.

20. Permitted colours.

21. Food preservatives.

22. Artificial sweeteners.

23. E. coli.

24. BOD.

25. Action of alcohol.

26. Lead toxiciy.

(8 × 2 = 16 Marks)

SECTION – C

Write short essays on **any six** of the following; each question carries **4** marks.

27. Digestion and absorption of carbohydrates.

28. Functions of Fat soluble vitamins.

29. Nutritional importance of proteins

30. Functions of calcium and phosphorus.

31. Importance of cereals in our diet

32. Edible oils and fats.

33. Food adulteration

34. Describe the enterohepatic circulation.

35. Microorganisms important in water

36. Production of cheese

37. Toxic effects of heavy metals

38. Cyanide poisoning.

(6 × 4 = 24 Marks)

SECTION – D

Write essays on **any two** of the following; each question carries **15** marks

39. Action of digestive enzymes.

40. Calorie requirements of different age groups.

41. Protein rich food materials

42. Different methods of food preservation.

43. Production of alcohol

44. Food additives.

(2 × 15 = 30 Marks)

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2022

First Degree Programme Under CBCSS

Biochemistry

Core Course VIII

BC 1544 : CLASSICAL AND MOLECULAR GENETICS

(2018 and 2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Very short answer type-maximum **two** sentences. Answer **all** questions. Each question carries **1** mark.

1. The genotypic ratio in the F1 generation of a monohybrid cross is ————————?
2. Name the process of synthesis of an RNA molecule from a DNA template.
3. Define epistasis.
4. What is genomic imprinting?
5. Name the process of DNA transfer in bacteria that requires a virus.
6. What is replicon?
7. Define allele.
8. What are exons?

P.T.O.

9. Define backcross

10. What is a plasmid?

(10 × 1 = 10 Marks)

SECTION – B

Short answer questions-not exceed one paragraph. Answer **any eight** questions. Each question carries **2** marks.

11. Name any three inhibitors of translation.

12. What are cosmids?

13. Define sigma (σ) factor.

14. What is an inversion?

15. What is the role of transposase?

16. Comment on photolyases.

17. Write a short note on the cDNA library.

18. Differentiate constitutive and inducible enzymes.

19. Define genetic anticipation.

20. The role of GATC sequence in DNA repair?

21. Write down the mechanism of action of UV radiation to DNA.

22. Define shine Dalgarno sequence.

23. Write on maternal inheritance.

24. What are termination codons?

25. What is restriction endonuclease? Give two examples with action.

26. Write notes on wobble hypothesis

(8 × 2 = 16 Marks)

SECTION – C

Short essay not exceeding **120** words. Answer **any six** of the following. Each question carries **four** marks.

27. Describe Griffith's experiments demonstrated transformation in bacteria.

28. Discuss on chromatin organization.

29. Discuss polyploidy and its significance.

30. Describe the epistasis gene interaction with example.

31. What is PCR? What are the steps of PCR reaction?

32. State different posttranscriptional modifications.

33. List four major types of aneuploidy.

34. What are the different characteristics of genetic code?

35. Discuss different types of mutation.

36. Discuss the lac operon.

37. Explain the pedigree analysis.

38. Explain the process of recombinant DNA technology.

($6 \times 4 = 24$ Marks)

SECTION – D

Long essay questions. Answer **any two** questions. Each question carries a **15** marks.

39. Describe the process of DNA replication in E. coli.

40. What is the operon concept? Illustrate tryptophan operon in E.*coli.*

41. Describe the bacterial protein biosynthesis.

42. Elaborate the process of prokaryotic transcription.

43. Explain the principle and applications of DNA fingerprinting.

44. Describe the conjugation, and transduction processes in bacteria.

($2 \times 15 = 30$ Marks)

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2022

First Degree Programme Under CBCSS

Biochemistry

Core Course

BC 1541 : PHYSIOLOGY AND IMMUNOLOGY

(2020 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions in a word or **two** sentences. **Each** question carries **1** mark.

1. Give the composition of plasma.
2. What is the normal bleeding time?
3. What is the reaction catalysed by carbonic anhydrase?
4. What are the phases of action potential?
5. Where does the glial cell exist in the body?
6. Give examples for inhibitory neurotransmitters.
7. Give the structure of estradiol.
8. What is inflammation?

9. What are epitope and paratope?

10. What are monoclonal antibodies?

(10 × 1 = 10 Marks)

SECTION – B

Answer **any eight** questions not to exceed a paragraph. **Each** question carries **2** marks.

11. Define leucopoiesis.

12. List out the functions of RBC.

13. Comment on chloride shift.

14. What is the function of rennin-angiotensin system?

15. Give the composition of bone.

16. What is rigor mortis?

17. What are hormones? Give examples.

18. List out the hormones that act via cyclic AMP as second messenger.

19. Define innate immunity.

20. What is primary and secondary immune response?

21. What are antigen and antibody?

22. Give the principle of ELISA.

23. What is erythroblastosis foetalis?

24. What is meant by refractory period?

25. List out the adrenal hormones.

26. What are immunoglobulins?

(8 × 2 = 16 Marks)

SECTION – C

Answer **any six** questions- Short essay - **Each** question carries **4** marks.

27. List out the functions of haemoglobin.

28. How do you classify blood groups?

29. Write a brief note on oxygen transport in blood.

30. Comment on metabolic acidosis.

31. Give a brief note on excitatory and inhibitory chemical synapses.

32. Comment on muscle proteins.

33. Classify hormones based on their chemical structure.

34. Write a short note on humoral mediated immunity.

35. Write the principle and applications of RIA.

36. Give the structures of aldosterone and testosterone

37. List out the functions of immunoglobulins.

38. How do you prepare plasma and serum from blood?

(6 × 4 = 24 Marks)

SECTION – D

Answer **any two** questions – Long essay - **Each** question carries **15** marks.

39. Discuss in detail about erythropoiesis.

40. Describe the biochemical events occur during muscular contraction.

41. Discuss the risk factors, symptoms, diagnosis and treatment of Rheumatoid arthritis.

42. Explain the functions of thyroid and pancreatic hormones.

43. Discuss in detail about agglutination reactions.

44. Describe about respiratory alkalosis and metabolic alkalosis.

(2 × 15 = 30 Marks)

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2022

First Degree Programme under CBCSS

Biochemistry

Core Course

BC 1542 : BIOENERGETICS AND CARBOHYDRATE METABOLISM

(2020 Admission)

Time : 3 Hours Max. Marks : 80

PART – A

Answer **all** questions in a word or to a maximum of 2 sentences. Each carries **1** mark.

1. State second law of thermodynamics.
2. Define Enthalpy.
3. What is exergonic reaction?
4. How many ATP moleculea are formed in anaerobic glycolysis?
5. Name the primer for glycogen synthesis.
6. Which is the key enzyme in glycogenolysis.
7. What is the function of Ubiquinone in electron transport chain.
8. Name a chemical that uncouples oxidative phosphorylation.
9. Who postulated chemiosmotic hypothesis?
10. Which is the immediate acceptor of CO_2 in Calvin cycle?

(10 × 1 = 10 Marks)

P.T.O.

PART – B

Write paragraphs on **any eight** of the following. Each carries **2** marks.

11. ATP
12. ATP/ADP cycle
13. Spontaneity of reactions.
14. Rapaport-Leubering shunt
15. Galactose metabolism
16. Glucose - Alanine cycle
17. Debranching enzymes
18. Glycogenin
19. Mobile electron carriers
20. Complex II
21. Cytochrome oxidase
22. P/O ratio
23. Uncouplers
24. ATP-ADP translocase
25. Photosynthetic unit
26. Mechanism of action of diuron.

(8 × 2 = 16 Marks)

PART – C

Write short essays on **any six** of the following. Each carries **4** marks.

27. High energy compounds
28. Gibb's equation and its application

29. Gluconeogenesis

30. Regulation of glucose metabolism

31. Glycogenolysis.

32. Regulation of glycose metabolism

33. Structural organization of electron transport chain

34. Ultrastructure of mitochondria and compartmentalization of enzymes

35. Transportation of reducing potentials into mitochondria

36. Inhibitors and uncouplers of oxidative phosphorylation

37. Ultrastructure of chloroplast and important function of each part.

38. Hatch-Slack pathway

(6 × 4 = 24 Marks)

PART – D

Write essays on **any two**. Each carries **15** marks.

39. Biological oxidation-reduction reactions.

40. Inborn errors in carbohydrate metabolism

41. Write on about glycogenesis and glycogenolysis.

42. Inhibitors of ETC

43. Steps of oxidative phosphorylation and chemiosmotic hypothesis.

44. Electron flow through photosystems I and II.

(2 × 15 = 30 Marks)

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2022

First Degree Programme under CBCSS

Bio Chemistry

Core Course

BC 1543: FOOD SCIENCE

(2020 Admission)

Time : 3 Hours **Max. Marks : 80**

SECTION – A

Answer **all** questions in **one** word or in **two** sentences. **Each** question carries **1** mark.

1. Define BMI range.
2. What is SDA?
3. Define Lathyrism.
4. Note on lectins.
5. Write note on dehydration.
6. Name two permitted food colours.
7. How is salmonellosis related to food poisoning?
8. What is mashing?
9. Define dietary fibres.
10. What is GHP?

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

Answer any **eight** questions not to exceed one paragraph. **Each** question carries **2** marks.

11. Define protein efficiencey ratio (PER).
12. List out the functions of calcium.
13. Write a note on net protein ratio.
14. Explain the chemical composition of beverages and soft drinks.
15. Brief note saponins.
16. Outline the causes of ergotism.
17. Give an account on autoclaving.
18. Define food preservatives. Why they are used?
19. Mention the aspects of qualitative detection of saccharine.
20. Name the adulterants present in butter and vegetable oil.
21. Explain the biochemical significances of staphylococcal poisoning.
22. Differentiate LTH and HTST employed in pasteurization.
23. List out the significances of neutraceuticals.
24. What is home fortification?
25. Define EPO.
26. What are the chemical and biological hazards present in food?

(8 × 2 = 16 Marks)

SECTION – C

Answer any **six** questions, short essay. **Each** question carries **4** marks.

27. Mention the functions of iodine.
28. Describe the factors affecting Basal Metabolic Rate.
29. List out the different antinutritional factors present in food.

30. Explain the basic principle of IR.

31. Mention how foods are preserved under low temperature.

32. Brief note on high osmotic pressure.

33. Describe how microorganisms are classified on the basis of temperature response in milk.

34. Write the mechanism of reductase test o access the quality of milk.

35. Write about the production of bread.

36. Discuss the advantages and disadvantages of food fortification.

37. Define FSSA 2006.

38. Explain essential commodities act.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions. Long essay. **Each** question carries **15** marks.

39. Discuss in detail about biochemical functions and deficiency diseases associated with vitamin A.

40. Give an account on Karl-Fischer titration and gas production method.

41. What ate food additives? Explain the significance and types of food additives used in food.

42. Explain in detail about the steps involved in the production of wine.

43. Outline the production of milk products with suitable example.

44. Elaborate in detail about the product certification/grading and food standards.

(2 × 15 = 30 Marks)

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc Degree Examination, December 2022

First Degree Programme under CBCSS

Bio Chemistry

Core Course

BC 1544: CLASSICAL AND MOLECULAR GENETICS

(2020 Admission)

Time : 3 Hours **Max. Marks : 80**

SECTION – A

Answer all the following questions in maximum two sentences. **Each** question carries **1** mark.

1. What you mean by inducible operon. Write example.
2. What is incomplete dominance?
3. What is nonsense mutation?
4. Define retrotransposons.
5. What is spontaneous mutation?
6. What are phage vectors
7. Define aneuploidy
8. Define penetrance.
9. What is RFLP?
10. What is Ames test?

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

Short answer questions not exceed one paragraph. Answer any **eight** questions. **Each** question carries **2** marks.

11. Write notes on helicase.
12. Define cDNA library.
13. Define splicing.
14. List out any two replication inhibitors with their mechanism?
15. Explain the process of Wobble base pair.
16. What is the action of Eco R1?
17. What is the basis of mismatch repair?
18. Write the importance of sigma (σ) factor.
19. Discuss the applications of PCR
20. Write notes on histones.
21. What is the frameshift mutation.
22. What is klenow fragment? What is the significance?
23. Discuss different inhibitors of translation with its mode of action.
24. What is DNA finger printing?
25. What did transformation experiment prove?
26. State the role of the rho factor

($8 \times 2 = 16$ Marks)

SECTION – C

Short essay not exceeding 120 words. Answer any **six** of the following. **Each** question carries **4** marks.

27. Explain the fidelity of DNA replication.
28. How is DNA packing into chromatin.

29. What are plasmids and cosmids? Explain properties and function.

30. What are the different characteristics of genetic code?

31. Explain the transposition

32. Write a note on the semiconservative mode of replication.

33. Explain Mendelian laws of inheritance.

34. Explain the process of conjugation.

35. Discuss on genomic imprinting.

36. What is gene expression?

37. What is the basis of repressible operon. Explain with example.

38. Give a brief account of prokaryotic transcription.

(6 × 4 = 24 Marks)

SECTION – D

Long essay questions. Answer any **two** questions. **Each** question carries **15** marks.

39. Enlist and explain different DNA repair mechanisms.

40. Explain operon concept. DNA repair mechanisms.

41. How does specialized transduction differ from generalized transduction?

42. Describe how nucleotide sequences of mRNA are translated into and amino acid sequence of a polypeptide in prokaryotes?

43. Explain different types of chromosomal aberrations.

44. Describe the methods involved in rDNA technology.

(2 × 15 = 30 Marks)

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Sixth Semester B.Sc. Degree Examination, April 2022

First Degree Programme under CBCSS

Biochemistry

Core Course – X

BC 1641 : CLINICAL BIOCHEMISTRY

(2014 & 2017 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

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

1. What are the three laboratory diagnostic process?
2. What are the anticoagulants are commonly used in clinical procedures?
3. Mention the level of glucose levels of normal, impaired glucose tolerance and diabetes mellitus.
4. Reference value of cholesterol ————————.
5. Function of TSH is ————————.
6. pH of the urine ———————— And Specific gravity of urine ————————.
7. List out the chemicals and stains used in gram staining.
8. Acid fast staining mainly used for identification of ————————.
9. What is antibiotic resistance?
10. What are the route of administration of drugs?

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

Write a paragraph on **any eight** of the following. Each question carries **2** marks.

11. Differentiate plasma and serum.
12. What are the factors affecting pre analytical phase most?
13. What is meant by reference value? And options for determining reference intervals.
14. What is the importance of reference intervals when interpreting results?
15. What is glomerular filtration test?
16. What are the marker enzymes of liver injury?
17. Give the details about the composition of CSF.
18. What is barcoding?
19. How will you differentiate gram positive and gram negative bacteria?
20. Define sterilization. List out its importances.
21. Define dosage of drug. Explain about absorption and distribution.
22. List out type of receptors and explain its mode of action.

(8 × 2 = 16 Marks)

SECTION – C

Short essays not exceeding **120** words. Answer **any six** of the following. Each question carries **4** marks.

23. Give a note on chemical and biological hazards of laboratory.
24. Write a short note on factors affecting the accuracy of results.
25. Give short notes on lipid profile.
26. Write about GTT.
27. Write about the significance of serum bilirubin.

28. Give an account on assay of T_3 and T_4 and its clinical significance.

29. Write about the advantages of automation in measurement method.

30. Discuss about types of media and culturing of bacteria.

31. Write about general mode of action of antibiotics.

($6 \times 4 = 24$ Marks)

SECTION – D

Answer **any two** of the following. Each question carries **15** marks.

32. Explain in detail on collection and preservation of samples.

33. Discuss in detail on cardiac markers and serum electrolytes.

34. Give detail description on principle of estimation and clearance tests of urea and creatinine and give its clinical significances.

35. Explain in detail on physical and chemical characteristics of urine and also normal and abnormal constituents with clinical significance.

($2 \times 15 = 30$ Marks)

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Sixth Semester B.Sc. Degree Examination, April 2022

First Degree Programme under CBCSS

Biochemistry

Core Course X

BC 1641 : CLINICAL BIOCHEMISTRY

(2018 & 2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

(Answer **all** questions in one word or maximum 2 sentences; each question carries **1** mark)

1. What is the normal value of fasting blood sugar?
2. Name the antibiotic that inhibits cell wall synthesis.
3. Which reagent is used for the determination of creatinine?
4. An abnormal constituent in blood.
5. A renal function test.
6. How is a heat labile culture medium sterilized?
7. What is an icteric serum sample?
8. A hemolysed serum sample gives a high potassium value. Why?
9. Name one liver marker enzyme.
10. Name the preferred anticoagulant used for the determination of blood glucose.

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

(Write short notes (one paragraph each) on any **eight** questions;
each question carries **2** marks)

11. Biological hazards.
12. Pre-analytical errors.
13. Cardiac markers.
14. Clinical significance of LDL cholesterol.
15. Impaired glucose tolerance.
16. Albumin/globulin ratio.
17. Conjugated bilirubin.
18. Alkaline phosphatase.
19. Normal constituents in urine.
20. Normal composition of CSF.
21. Bar coding in laboratory.
22. Antibiotic resistance.
23. Gram positive bacteria.
24. Pharmacodynamics.
25. ADME
26. LD_{50}

($8 \times 2 = 16$ Marks)

SECTION – C

(Write short essays on any **six** questions; each question carries **4** marks)

27. Management of hazards in laboratory.
28. Management of errors in laboratory.
29. Principle of estimation, normal values and clinical significance of total serum cholesterol.
30. Assay of cardiac marker enzymes and their clinical significance.

31. Tests for excretory function of liver.
32. Renal function tests.
33. Physical characteristics of urine.
34. Routine analysis of CSF.
35. The four corners of pharmacokinetics.
36. Automation in clinical laboratory.
37. Gram staining.
38. General mode of action of tetracycline and penicillin.

(6 × 4 = 24 Marks)

SECTION – D

(Write essays on any **two** questions; each question carries **15** marks)

39. Types of receptors and their mode of action.
40. Methods used for the identification of bacteria.
41. Analysis of urine and its clinical significance.
42. Thyroid function tests and its clinical significance.
43. Analysis of lipid profile and its clinical significance.
44. Collection and preservation of clinical specimens.

(2 × 15 = 30 Marks)

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Name : .....

Sixth Semester B.Sc. Degree Examination, April 2022

First Degree Programme under CBCSS

Biochemistry

Core Course XI

BC 1642 : METABOLISM II

(2014 & 2017 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

(Very Short Answer Type-maximum two sentences)

(Answer all questions. Each carries **1** mark)

1. Name the enzyme deficient in phenyl ketonuria
2. Define photosystern
3. Name a peroxisomal disorder affecting phytanic acid alpha-oxidation.
4. Which coenzyme is required for the conversion of Acetyl CoA to malonyl CoA?
5. Name any three hormones synthesized from cholesterol
6. Which reaction is catalyzed by ATCase?
7. How many ATP molecules ace produced during the complete oxidation of palmitic acid?

P.T.O.

8. Name the end product of purine catabolism in humans

9. Name the sources of the atoms in the pyrimidine ring

10. What is Hartnup's disease?

(10 × 1 = 10 Marks)

SECTION – B

(Short Answer Questions-not to exceed one paragraph)

(Answer any **eight** questions. Each carries **2** marks)

11. Write down the action of ribonucleotide reductase?

12. Explain the role of carnitine.

13. Write notes on the formation of glycine from serine

14. Write notes on nitrogen cycle

15. Explain the source of NADPH for fatty acid synthesis?

16. How triglyceride get hydrolysed?

17. What is oxidative deamination?

18. Write notes on gout.

19. Explain the role of Cytochrome bf complex in light reaction.

20. Write notes on Lesch-Nyhan syndrome

21. What is photorespiration

22. State the role of xanthine oxidase

(8 × 2 = 16 Marks)

SECTION – C

(Short Essay-not to exceed **120** words)

(Answer any **six** questions. Each carries **4** marks)

23. Write a short note on nitrogen fixation

24. What are ketone bodies? Explain their role in biological system?

25. Explain the beta oxidation pathway for fatty acids

26. Explain the catabolism of phenylalanine

27. Explain the biotransfonnation of toxic substances in the body

28. Discuss the degradation of heme

29. Explain briefly role of Cytochrome P450 in detoxification process

30. Outline the urea cycle

31. Explain C4 plants

(6 × 4 = 24 Marks)

SECTION – D

(Long Essay)

(Answer any **two** questions. Each carries **15** marks)

32. Explain briefly the hepatic detoxification process.

33. Enumerate the major steps for the synthesis of cholesterol. How cholesterol biosynthesis is regulated?

34. Describe the biosynthesis of fatty acids?

35. Illustrate the biosynthesis and degradation of purine nucleotides.

(2 × 15 = 30 Marks)

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Name : .....

Sixth Semester B.Sc. Degree Examination, April 2022

First Degree Programme under CBCSS

Biochemistry

Core Course XI

BC 1642 : METABOLISM II

(2018 & 2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

(Very Short Answer Type – Maximum two sentences)

(Answer **all** questions. Each carries 1 mark)

1. What are ketone bodies? Name them.
2. What are sphingolipids? Name the sphingolipid present in myelin sheath.
3. What are glucogenic amino acids? Give two examples.
4. What is gout?
5. Identify the enzyme defects in alkaptonuria and albinism.
6. Write the structure of Sugar present in DNA.
7. Name the two catalytic activities of RuBisCo?
8. Name any two inborn errors of amino acid metabolism.
9. What are xenobiotics? Where are they metabolized?
10. What is ketonuria?

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

(Short Answer Questions – not to exceed one paragraph)

(Answer any **eight** questions. Each carries **2** marks)

11. Make a note on the significance of HMG CoA Reductase.
12. How does glucuronidation take place?
13. Explain transamination reaction.
14. Explain the sources of atoms of purines.
15. Write a short note on Rhizobium.
16. How is carbamoyl phosphate formed in urea cycle?
17. What is Salvage pathway? Explain.
18. Outline the ultrastructure of chloroplast.
19. What is nitrogen balance?
20. Name the components of fatty acid synthase complex.
21. Distinguish between C3 and C4 plants.
22. What is symbiosis?
23. How is ammonia transported to liver from extrahepatic tissues?
24. What is photorespiration?
25. What is albinism?
26. What is porphyria?

(8 × 2 = 16 Marks)

SECTION – C

(Short Essay – not to exceed 120 words)

(Answer any **six** questions. Each carries **4** marks)

27. Biosynthesis of phospholipids.
28. Biosynthesis of Sphingolipids.
29. Biosynthesis of ATP.
30. Biological nitrogen fixation.
31. Role of Cytochrome P450 in detoxification.

32. Calvin cycle.
33. β-oxidation pathway.
34. Explain the disorders in lipid metabolism.
35. Catabolism of pyrimidines.
36. Biosynthesis of bile acids.
37. Importance of phosphatidic acid in lipid metabolism.
38. Cyclic photophosphorylation.

(6 × 4 = 24 Marks)

SECTION – D

(Long Essay)

(Answer any **two** questions. Each carries **15** marks)

39. Discuss the biosynthesis of palmitic acid and its further chain elongation.
40. Urea cycle and its regulation.
41. Explain the catabolism of phenylalanine and indicate the inborn errors involved in the pathway.
42. Oxidation of saturated and unsaturated fatty acids.
43. Metabolism of Ketone bodies.
44. Detoxification process in liver.

(2 × 15 = 30 Marks)

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Name : .....

Sixth Semester B.Sc. Degree Examination, April 2022

First Degree Programme Under CBCSS

Biochemistry

Elective Course

BC 1661.1 : MOLECULAR BIOTECHNOLOGY

(2018 & 2019 Admission)

Time : .3 Hours Max. Marks : 80

SECTION – A

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

1. What kind of cells is used for extraction of DNA in the experiment?
2. After centrifugation, the supernatant being pipetted out contains _____
3. What are two functions of restriction enzymes?
4. Who carried out in vitro synthesis of DNA?
5. List the use of blotting.
6. Define electrophoresis.
7. What are the four steps of DNA fingerprinting?
8. Explain the four main components needed to make a transgenic plant?

P.T.O.

9. Define knock out mice.

10. What is gene therapy?

(10 × 1 = 10 Marks)

SECTION – B

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

11. Define radioactive Labelling of DNA.

12. What is meant by antisense RNA?

13. Write the steps involved in Southern blotting?

14. What are the steps involved in DNA fingerprinting?

15. Define the use of transgenic plants.

16. Name the steps involved in southern blotting.

17. Define gene therapy, give example.

18. Why is gene therapy illegal?

19. Write the application of aptamers.

20. Define the importance of transgenic plants.

21. What is transgenic and knockout mice?

22. Explain *in vitro* and in *vivo* synthesis.

23. Why is SCID called bubble boy disease?

24. What are the limitations of a gel mobility shift assay?

25. What is the application of western blot?

26. Which membrane is used in blotting?

(8 × 2 = 16 Marks)

SECTION – C

Answer **any six** questions. **Each** question carries **4** marks.

27. What is the importance of cloning vector?
28. What is cloning vector and what are the types of cloning vectors?
29. What are the important applications of PCR?
30. What are the types of DNA sequencing?
31. Define blotting and its types.
32. Write a short note on CAT assay.
33. What are aptamers and how are they used for the detection of DNA damage?
34. Explain the advantages and disadvantages of transgenic plants.
35. What are liposomes? How it is used in gene therapy?
36. Define aptamers? How are they used for the detection of DNA damage?
37. Explain the symptoms of SCID.
38. Write the role of Ti plasmid in plant transformation.

(6 × 4 = 24 Marks)

SECTION – D

Answer **any two** questions. **Each** question carries **15** marks.

39. Explain isolation and purification of DNA.
40. Write the principle, procedure and application of RT-PCR.
41. Discuss the principle, methods and applications of DNA finger printing.
42. Discuss Severe combined immunodeficiency syndrome.
43. Write a note on Liposomes in Gene Therapy.
44. Explain in detail Site-directed mutagenesis.

(2 × 15 = 30 Marks)

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Name : .....

Sixth Semester B.Sc. Degree Examination, April 2022

First Degree Programme under CBCSS

Biochemistry

Elective Course

BC 1661.2 : IMMUNOLOGY AND IMMUNOLOGICAL TECHNIQUES

(2018 & 2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – I

(Very Short answer type – maximum of **2** sentences)

(Answer **all** questions)

1. What do you understand by Serum?
2. Name the major cells of Immune system.
3. Define the three cell types that function as Phagocytes.
4. What are the types of Immune responses?
5. Define Epitopes.
6. Name the different classes of Immunoglobulins.
7. Expand the full form of MHC antigens.
8. What is allergy?
9. Give the full form of ELISA.
10. What is AIDS?

(10 × 1 = 10 Marks)

P.T.O.

SECTION – II

(Short answer questions – Not to exceed **1** paragraph)

(Answer **any eight** questions)

11. What do you know about Immunity? Mention the types.
12. Write the names of any four mononuclear phagocytes.
13. Name primary lymphoid organs.
14. What are called antigen presenting cells?
15. Which Immunoglobulins exist in polymeric forms?
16. Name the enzymes used to cleave the Ig molecule.
17. What are Cytokines? Enumerate them.
18. Write a note on T-cell receptor.
19. Define autoimmunity. Mention two autoimmune diseases.
20. What do you know about Immunodeficiency disease?
21. Define Precipitation.
22. Enumerate functions of Lymph nodes.
23. What is the importance of immunoglobulin G?
24. What do you understand by agglutination?
25. What do you understand by complement system in an immune response?
26. What are the different types of Immunity?

(8 × 2 = 16 Marks)

SECTION – III

(Short Essay – not to exceed **120** words)

(Answer **any six** questions)

27. Write brief account on secondary lymphoid organs and its importance.
28. What is Humoral immune response?

29. How do you explain the production of unlimited number of antibodies?

30. Differentiate between mature B-cells and functional B-cells.

31. What are risk factors for AIDS?

32. What are the properties of Hybridoma cells?

33. What are haptens?

34. What is meant by the term antigenic determinant and valence?

35. State the therapeutic uses of Monoclonal antibodies.

36. Write a short note on Immunoflourescence.

37. Write the purpose of Immunization.

38. What is the differences between Live and killed vaccines?

(6 × 4 = 24 Marks)

SECTION – IV

(Long essay)

(Answer **any two** questions)

39. What are the functions of Thymus in the body?

40. Explain the mechanism of Vaccination (or) Immunization.

41. Write the differences between immediate and delayed hypersensitivity.

42. What is cellular immune response?

43. State the salient features of structure of an Immunoglobulin molecule.

44. Explain the specificity of antigen : antibody reactions.

(2 × 15 = 30 Marks)

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