(Pages : 4) **L – 3811**

**Reg. No. :** 247201320 49

**Name :** Vrinda Vinod

**First Semester B.Sc. Degree Examination, August 2021**

**Career Related First Degree Programme under CBCSS**

**Group 2 (a) – Botany and Biotechnology**

**Complementary Course I**

**BB 1131 : PHYSICAL ASPECTS OF BIOCHEMISTRY**

**(2020 Admission Regular)**

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. Short answer type. **Each** question carries **1** mark.

1. What is pH?
2. Name two biological buffers.
3. What is molarity?
4. Define osmotic pressure.
5. What is Tyndall effect?
6. State Beer-Lambert law.
7. Name an adsorbent used in TLC.
8. What is electrophoresis?

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9. Which type of macromolecules have peptide bonds?

10. Give two examples for non-covalent bonds.

**(10 × 1 = 10 Marks)**

## SECTION – B

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

11. How do buffers resist change in pH?

12. Show that ionic product of water is a constant.

13. Write the Hederson Hasselbalch equation and give one use of this equation.

14. Spell out any four unique properties of water

15. One liter of a public water supply contains 3mg chlorine; calculate the ppm of chlorine in the sample.

16. What is the basic principle of diffusion?

17. How can a colloidal solution and true solution of the same colour be distinguished from each other?

18. What is the difference between oil in water emulsion and water in oil emulsion?

19. What are monochromators? Name the monochromators used in spectrophotometers.

20. What is a Svedberg unit? What is the value of one Svedberg?

21. What is a glass electrode?

22. What is the principle of affinity chromatography?

23. What are ion exchange resins?

24. What is electroendosmosis?

25. Name the functional groups in Cysteine.

26. Distinguish between peptide bond and glycosidic bond.

**(8 × 2 = 16 Marks)**

## SECTION – C

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

27. What property makes water a universal solvent? Explain.

28. Discuss the different biological buffer systems.

29. How does diffusion differ from osmosis? Explain.

30. Discuss Vant-Hoff's law of osmotic pressure and its application.

31. Distinguish between emulsions and emulsifying agents with suitable examples.

32. With the help of a net diagram describe the parts of a single beam spectrophotometer.

33. Discuss the principle and application of density gradient centrifugation.

34. Explain the principle and applications of TLC.

35. What is native PACE? What is it used for?

36. What are non covalent bonds? Discuss the different types non-covalent bonds.

37. Explain the significance of functional groups in biomolecules.

38. Discuss the most suitable method for separating and detecting amino acids in a given sample of protein hydrolysate.

**(6 × 4 = 24 Marks)**

## SECTION – D

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

39. Discuss the principle and applications of buffers.

40. Write the principle, procedure and applications of gelfiltration.

41. Discuss the principle, procedure and applications of differential centrifugation.

42. Explain the principle, procedure and applications of SDS-PAGE

43. Give an account of inter and intramolecular interactions in biological systems.

44. Describe the parts of a pH meter. How is it used for measuring the pH of a solution.

**(2 × 15 = 30 Marks)**

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(Pages : 3) **H – 2229**

**Reg. No. :** 24711913 2005

**Name :** Anu Keerthana K R

**First Semester B.Sc. Degree Examination, November 2019**

**Career Related First Degree Programme under CBCSS**

**2(a) – Botany and Biotechnology**

**Complementary Course I : BB 1131**

**INTRODUCTION TO CHEMISTRY**

**(2014 Admission Onwards)**

Time : 3 Hours Max. Marks : 80

SECTION – I

Very short answer type. Maximum **2** sentences. Answer **all** questions :

1. Define pH value.
2. What is meant by buffer capacity?
3. Define : Osmosis.
4. What is the principle of electrophoresis?
5. What are stereoisomers?
6. Write the principle of colorimeter.
7. What is meant by true solution?

P.T

8. Define viscosity.

9. List out the functions of emulsifying agents.

10. Examples of colloidal solution.

**(10 × 1 = 10 Marks)**

## SECTION – II

Short answer questions not to exceed **1** paragraph. Answer **any eight** questions :

11. State Vander Wall's force.

12. What is molarity and molality?

13. Distinguish between diffusion and osmosis.

14. State Vant Hoff's law of osmotic pressure.

15. List out the applications of zone electrophoresis.

16. What is the significance of emulsion?

17. How are peptide bonds formed?

18. Write down the biological importance of osmosis.

19. Brief the types of emulsions.

20. List any four applications of thin layer chromatography.

21. State Beer's law.

22. Define Isopycnic centrifugation.

**(8 × 2 = 16 Marks)**

## SECTION – III

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

23. Derive Henderson Hasselbalch equation.
24. Define hypotonic, isotonic, hypertonic solutions.
25. Explain the technique of density gradient centrifugation.
26. What is molar extinction co-efficient? Explain.
27. Explain the principle and procedure of paper chromatography.
28. Write the classification of isomers.
29. How are hydrogen and covalent bond formed?
30. Write a short note on surface tension.
31. What are optical isomers? Explain with examples.

**(6 × 4 = 24 Marks)**

## SECTION – IV

Long Essay. Answer **any two** questions :

32. Discuss ion exchange chromatography as a technique for the separation of macromolecules.
33. Describe the principle and instrumentation of spectrophotometer.
34. Explain Donnan membrane equilibrium and its biological significance.
35. Give a detailed account on analytical and preparative ultra centrifuge.

**(2 × 15 = 30 Marks)**

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(Pages : 3) **F – 2018**

Reg. No. : 24718132011

Name : Nandhana B

**First Semester B.Sc. Degree Examination, November 2018**
**Career Related First Degree Programme under CBCSS**
**2 (a) : BOTANY AND BIOTECHNOLOGY**
**Complementary Course I : BB 1131**
**Introduction to Biochemistry**
**(2014 Adm. Onwards)**

Time : 3 Hours

Max. Marks : 80

SECTION – I

**(Very Short Answer Type-maximum two sentences)**

Answer **all** questions. **(10×1=10 Marks)**

1. Define ionic product of water.
2. Write down Henderson-Hasselbalch equation.
3. Define osmotic pressure.
4. What are isotonic solutions ?
5. What is Brownian movement ?
6. What are emulsifying agents ? Give one example.
7. Define : a) Transmittance b) Absorbance.
8. What is sedimentation coefficient ? What is its unit ?
9. Name the chromatographic technique by which the molecules are separated based on difference in molecular size ?
10. How is a peptide bond formed ?

**P.T.O.**

F – 2018

## SECTION – II

**(Short Answer Questions – not to exceed one paragraph)**

**(8×2=16 Marks)**

Answer **any eight** questions.

11. Define buffer and explain the components of a buffer.
12. Define pH and pOH and show how they are related.
13. Calculate the molarity of NaOH solution obtained by dissolving 2 g of NaOH in 50 ml water.
14. Explain Van't Hoff's law.
15. Distinguish between a true solution and a colloidal solution.
16. Make a note on emulsions.
17. State and explain Beer Lambert law.
18. What are the important parts of a pH meter ?
19. What is the principle of TLC ?
20. What are the applications of affinity chromatography.
21. Name the functional groups in : Ethanol, Acetone, Acetic acid and Methyl mercaptan.
22. Make a note on Van der Wall's force.

## SECTION – III

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

Answer **any six** questions. **(6×4=24 Marks**

23. Buffers in biological systems.
24. Determination of molecular mass from osmotic pressure.
25. Any four parameters used to express concentration.

26. Sterioisomerism.

27. Donnan membrane equilibrium.

28. Colorimetry.

29. Isopycnic centrifugation.

30. Principle and applications of paper chromatography.

31. Non-covalent interactions.

## SECTION – IV

## (Long Essay)

Answer **any two** questions. **(15×2=30 Marks)**

32. Discuss the properties of colloids.

33. Explain the principle, procedure and applications of SDS-PAGE.

34. Explain how the components of a cell are separated by differential centrifugation.

35. Principle, procedure and applications of gel filtration chromatography.

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D – 5150

(Pages : 3)

Reg. No. : 24711320023

Name : Aranya. V. Roy

**First Semester B.Sc. Degree Examination, February 2018**
**Career Related First Degree Programme under CBCSS**
**2(a) – BOTANY AND BIOTECHNOLOGY**
**Complementary Course I : BB 1131**
**Introduction to Biochemistry**
**(2014 Adm. Onwards)**

Time : 3 Hours

Max. Marks : 80

SECTION – I

(**Very** short answer type-maximum **two** sentences)

**(10×1=10 Marks)**

Answer **all** questions.

1. What is pH ? What is the pH of 0.01 M HCl solution ?
2. What is a buffer ? Name two biological buffers.
3. State Van't Hoff's law.
4. Define normality and molarity.
5. What is surface tension ?
6. What is Tyndall effect ?
7. State Beer-Lambert's law.
8. What is ultracentrifugation ?
9. Define $R_f$ value.
10. Name the characteristic bonds in
    a) Polysaccharides and
    b) Nucleic acids.

P.T.O.

## SECTION – II

(**Short** answer questions – **not** to exceed **one** paragraph)

Answer **any eight** questions. **(8×2=16 Marks)**

11. Write down Henderson-Hasselbalch equation and enumerate its applications.
12. Explain the ionisation of water and show ionic product of water is a constant.
13. Distinguish between osmosis and diffusion.
14. Write a note on biological importance of osmosis.
15. Name and explain the two phases in a colloidal solution with a suitable example.
16. What is meant by Donnan membrane equilibrium.
17. What is a monochromator ? Name two monochromators used in spectrophotometers.
18. What is RCF ? How is it related to rpm ?
19. What is the principle of paper chromatography ?
20. Make a note on the applications of gel filtration chromatography.
21. What is hydrogen bond ? What is its importance ?
22. What is optical isomerism ? What sort of molecules show this isomerism ?

## SECTION – III

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

Answer **any six** questions. **(6×4=24 Marks)**

23. Structural features of water.
24. Osmotic pressure and its measurement and applications.
25. Distinction between lyophilic and lyophobic colloids.
26. Emulsions and emulsifying agents.
27. Parts of a spectrophotometer.

28. TLC.

29. Gel electrophoresis.

30. Principle and applications of affinity chromatography.

31. Different types of isomerism.

## SECTION – IV
## (**Long** essay)

Answer **any two** questions. **(15×2=30 Marks)**

32. Discuss the principle and working of a pH meter.

33. Explain the principle, procedure and applications of ion-exchange chromatography.

34. Describe a technique by which you can isolate cell organelles.

35. Discuss the common functional groups and their significance in bio molecules.

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(Pages : 3) **10026**

Reg. No. : 2MT15132024

Name : SARATH A.S.

**First Semester B.Sc. Degree Examination, January 2016**
**(Career Related First Degree Programme under CBCSS)**
**Group – 2(a) : BOTANY AND BIOTECHNOLOGY**
**Complementary Course**
**BB 1131 : Introduction to Bio-chemistry**
**(2014 Admission)**

Time : 3 Hours Max. Marks : 80

SECTION – I

Very short answer type – maximum **two** sentences : **(10×1=10 Marks)**

1. At what rate water molecule dissociates ?
2. What are bases give examples ?
3. Define pKa value of an acid.
4. What is meant by isotonic solution ?
5. What are emulsions ?
6. Unit of sedimentation rate.
7. What are ion exchangers ?
8. Write the principle of electrophoresis.
9. What do you mean by hydrogen bond ?
10. Define geometric isomerism.

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## SECTION – II

(Short answer questions not exceed **one** paragraph) :

Answer **any eight** questions : **(8×2=16 Marks)**

11. If pH of a solution is 2 what is pOH value ?
12. What is percentage solution ? How will you prepare it ?
13. What do you mean by physiological saline ?
14. Why DNA solution is viscous ?
15. What are emulsifying agents ?
16. Differentiate colorimeter and spectrophotometer.
17. What are the electrodes used in pH meters ?
18. Note on ion exchangers.
19. Applications of paper electrophoresis.
20. How ester bond is formed ?
21. Commends on phosphodiester bond.
22. What are anomers ? Give example.

## SECTION – III

(Short essay not exceed **120** words) :

Answer **any six** questions : **(6×4=24 Marks)**

23. Explain ionic product of water andits importance in pH calculations.
24. Osmotic pressure of a sugar solution is 1.43 atm. at 25°C one litre of the solution contains 20 g. Calculate the molecular weight of the sugar.
25. Explain isopynic centrifugation.
26. Details of gel filtration chromatography.

27. How will you differentiate different emulsions ?

28. Describe the working of TLC.

29. What are the molecular interactions present in DNA ?

30. How disulphide bonds formed and its importance ?

31. Classify isomerism with example.

## SECTION – IV

*(Long essay) :*

*Answer* ***any two*** *questions :* **(2×15=30 Marks)**

32. Derive Henderson-Hasselbalch equation and its importance.

33. Principle and working of pH meters.

34. Write an essay on SDS PAGE.

35. Important functions of OH, SH and $NH_2$ groups.

(Pages : 3) 7282

Reg. No. : 24714132004

Name : Anju. V

**First Semester B.Sc. Degree Examination, December 2014**
**Career Related First Degree Programme under CBCSS**
**Group 2 (a) : Botany & Biotechnology**
**Complementary Course**
**BB1131 : INTRODUCTION TO BIOCHEMISTRY**
**(2014 Admission)**

Time : 3 Hours Max. Marks : 80

SECTION – I

Very short answer type – maximum **two** sentences.

Answer **all** questions. **(10×1=10 Marks)**

1. What type of hydrogen bonding is present in water ?
2. Why HCl is considered as an acid ?
3. What is a buffer solution ?
4. How will you prepare a 1N solution of an acid ?
5. What you mean by a true solution ?
6. Define Beer-Lambert's law.
7. Write the principle of TLC.
8. Use of SDS in electrophoresis.
9. Importance of SH groups.
10. What you mean by Vander-Waals interactions.

P.T.O.

7282

## SECTION – II

Short answer questions – **not** exceed one paragraph. **(8×2=16 Marks)**

Answer **any eight** questions.

11. Write note on ionic product of water.
12. Why acetic acid is considered as a weak acid ?
13. Commends on pH scale.
14. Differentiate Osmosis and simple diffusion.
15. What are crystalloids ?
16. Define molar extinction coefficient.
17. What you mean by density gradient centrifugation ?
18. Write the principle of TLC and Thin layer materials.
19. Commends on gel materials used in gel filteration chromatography.
20. Write the principle of SDS-PAGE.
21. Write the oxidation reaction of CHO groups.
22. Note on glycosidic bonds.

## SECTION – III

Short Essays – **not** to exceed **120** words.

Answer **any six** questions. **(6×4=24 Mark**

23. Describe pH scale.
24. Calculate the pH of 0.0025 N HCl.
25. What you mean by membrane hydrolysis ?
26. Write on the applications of ultracentrifuge.
27. Write the biological significance of colloids.

28. Note on gel electrophoresis.

29. Commends on molecular interaction in Protein.

30. Explain the features of peptide bond.

31. Oxidation reactions of CHO groups.

## SECTION – IV

**(Long Essays)**

Answer **any two** questions. **(15×2=30 Marks)**

32. Explain Donnan membrane equilibrium and its biological significance.

33. a) Explain the mechanism of osmotic pressure.

    b) Write vant Hoff laws of osmotic pressure.

34. Explain Handerson-Hassel batch equation.

35. Explain the function of pH meter.