D 93565 (Pages : 2) Name.....

Reg. No.....

FIRST SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2020

(CCSS)

Biochemsitry

BCH 1C 01—ANALYTICAL BIOCHEMISTRY

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Section A

Answer **all** *questions in* 2 **or** 3 *sentences.*

Each question carries 2 *marks.*

1. What is the principle of partition chromatography ?
2. What is centrifugal force ?
3. Define Rf value in chromatography.
4. What are the units for the measurement of radioactivity ?
5. What is the principle of fluorimetry ?
6. Write down the major applications of atomic absorption spectroscopy.
7. What is the difference between accuracy and precision ?
8. What is the principle of gel filtration ?
9. Write down applications of 2D PAGE
10. How will you detect nucleic acids after agarose gel electrophoresis ?
11. Write down two applications of ultracentrifuge.
12. What is the principle of electrophoresis ?
13. Why do we fix the cells in histopathological studies ?
14. What is the difference between primary and secondary fluors?
15. Describe the principle of isoelectric focussing.
16. What are the applications of X-ray diffraction technique ?

17. Write down Beer-Lambert law.

18. Define osmosis.

19. How can you extract solid samples ?

20. What is the basic difference between SDS PAGE and native gel electrophoresis ?

(20 × 2 = 40 marks)

Section B

Answer **five** *questions.*

Each question carries 8 *marks.*

21. Write notes on affinity chromatography.

22. Give an account of Western blotting.

23. Describe the principle and applications of scintillation counters.

24. Write an essay on flow cytometry.

25. Describe the principle and working of phase contrast microscope.

26. Describe the working of a UV visible spectrophotometer.

27. Explain the steps to be undertaken for the automation of your laboratory.

(5 × 8 = 40 marks)

D 93380 **(Pages : 2)** **Name.....**

Reg. No.....

FIRST SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2020

(CBCSS)

Biochemistry

BCH 1C 01—ANALYTICAL BIOCHEMISTRY AND BIO ANALYTICAL TECHNIQUES

(2019 Admissions)

Time : Three Hours Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Part A (Short Answers)

Answer any **four** *questions.*
Each question carries 2 *weightage.*

1. What is Cerenkov counting ?
2. List out the detectors used in HPLC.
3. Mention the cause intrinsic and extrinsic protein fluorescence.
4. Write about the application of a rotary evaporator.
5. List the different types of rotors used in centrifugation.
6. Write the cause of post source decay in TOF analyzers.
7. Define Dosimetry.

(4 × 2 = 8 weightage)

Part B (Short Essays)

Answer any **four** *questions.*
Each question carries 3 *weightage.*

8. Give a brief description of the properties of α, β and γ-rays.
9. Explain the instrumentation of a Gas chromatograph.
10. Give a brief account of Northern blotting.
11. Write down the principle and applications of ultracentrifugation.
12. Give a brief description on polarimetry.
13. Explain the different ways of presenting data.
14. Write a short essay on fluorimetry.

(4 × 3 = 12 weightage)

Part C (Long Essays)

Answer any **two** *questions.*
Each question carries 5 *weightage.*

15. Discuss in detail SDS-PAGE and its applications.
16. Give a detailed account of NMR-spectroscopy and its applications.
17. Discuss about the different instruments used in an automated clinical laboratory.
18. Give a detailed account of the technique and applications of Ion exchange chromatography.

(2 × 5 = 10 weightage)

D 93381 **(Pages : 2)** **Name.....**

Reg. No.....

FIRST SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2020

(CBCSS)

Biochemistry

BCH 1C 02—STRUCTURAL BIOLOGY, BIOINFORMATICS AND BIOSTATISTICS

(2019 Admissions)

Time : Three Hours Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Part A (Short Answers)

Answer any **four** *questions.*

Weightage 2 *each.*

1. What is a glycosidic iinkage ?
2. Explain the term "denaturation".
3. Define homeobox.
4. Explain the significance of cot curves.
5. Discuss on data deposition policy.
6. Differentiate between a domain and a motif.
7. What is 'Statistical dispersion' ?

(4 × 2 = 8 weightage)

Part B (Short Essay)

Answer any **four** *questions.*

Weightage 3 *each.*

8. Give an account on protein secondary structure.
9. Discuss on the protein folding energetics.
10. Write a short note on denaturation of nucleic acids.
11. Outline the structure of a chromatin.
12. Discuss on the various structural alignment methods in Bioinformatics.
13. Write a review on rational drug design and molecular docking.
14. Give a brief account on the different levels of significance in biostatistics.

(4 × 3 = 12 weightage)

Part C (Long Essay)

Answer any **two** *questions.*

Weightage 5 *each.*

15. Describe the structure, confirmation and properties of polysaccharides.
16. Describe the structure and 3D conformation of tRNA.
17. Discuss in detail, the various types of databases which aids in structure prediction and function prediction of biomolecules.
18. Write an essay on the principles and practice of statistical methods in biological research.

(2 × 5 = 10 weightage)

D 93382 **(Pages : 2)** **Name**.....

Reg. No.....

FIRST SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2020

(CBCSS)

Biochemistry

BCH 1C 03—MICROBIOLOGY AND IMMUNOLOGY

(2019 Admissions)

Time : Three Hours Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Part A (Short Answers)

Answer any **four** *questions.*
Weightage 2 *each.*

1. How are bacteria differentiated according to gram staining ?
2. Draw and explain the effect of temperature on bacterial growth.
3. What are the damaging effects of UV on bacteria ?
4. Illustrate the differences in antibody response between primary and secondary immune response.
5. What role do immunoglobulins play in opsonisation ?
6. What is a VDRL test ?
7. Briefly explain ecological ethics.

(4 × 2 = 8 weightage)

Part B (Short Essay)

Answer any **four** *questions.*
Weightage 3 *each.*

8. What are bacteriophages ? Explain their different life cycles.
9. Explain the principle and application of phase constrast microscopy in microbiology.
10. Write a short essay on sterilization and disinfection agents.
11. What are primary lymphoid organs ? Explain their role in immunity.

Turn over

12. Innate immunity is non-specific in nature. Explain.
13. Write a short essay on MHC molecules in host vs graft recognition.
14. Institutional ethics committees are essential for ethical research. Justify.

(4 × 3 = 12 weightage)

Part C (Long Essay)

Answer any **two** *questions.*
Weightage 5 *each.*

15. Discuss in detail the various methods for classification and microbes.
16. Explain the structural features and their unique functional capabilities of different immunoglobin classes.
17. What are hypersensitivity reactions ? Explain their types and mechanism of onset.
18. Do GM crop research pose a potential hazard ? Analyze and comment in detail.

(2 × 5 = 10 weightage)

D 93211 **(Pages : 2)** **Name**.....

Reg. No.....

FIRST SEMESTER M.Sc. DEGREE (SUPPLEMENTARY) EXAMINATION NOVEMBER 2020

(CUCSS)

Biochemistry

BC 1C 01—GENERAL AND ANALYTICAL BIOCHEMISTRY

(2013 Admissions)

Time : Three Hours Maximum : 36 Weightage

Section A

Answer any **fourteen** *questions.*

- *Each question carries a weightage of* 1.

1. Describe an ionic bond.
2. What are glycoproteins ?
3. Why is glycine different from other amino acids ?
4. What are leukotrienes ?
5. Draw the structure of guanine and cytosine and mark the hydrogen bonds between them.
6. What is the function of hormone receptor ?
7. What is the calorific value of proteins and fats ?
8. What is the main cause of Marasmus ?
9. What are the units for the measurement of radioactivity ?
10. What is the principle of fluorimetry ?
11. Write down the major applications of atomic absorption spectroscopy.
12. How do you collect CSF specimen ?
13. Give the full forms of ELISA and HPTLC.
14. What are polar solvents ? Give examples.
15. What is an isotope ?
16. Name two peptide hormones.

(14 × 1 = 14 weightage)

Turn over

Section B

Answer any **seven** *questions.*
Each question carries a weightage of 2.

17. Describe the significance of hydrogen bonds in water.
18. Write notes on glycosides and their functions.
19. What are phospholipids ? What are their functions ?
20. What are the functions of fat-soluble vitamins ?
21. Write down the applications of tracer technique in biology.
22. Give an account to thin layer chromatography.
23. Give a brief account of major instruments used in an automated biochemistry laboratory.
24. Describe the classification of fatty acids.
25. Give an account of the government regulations on preservation and quality of foods.

(7 × 2 = 14 weightage)

Section C

Answer any **two** *questions.*
Each question carries a weightage of 4.

26. Describe the structure of proteins.
27. What is chemical structure, properties and functions of thyroid hormones.
28. Write an essay on the principle and applications of various centrifugation techniques.
29. Describe the classification of carbohydrates. Give examples.

(2 × 4 = 8 weightage)

D 93212 **(Pages : 2)** **Name**.....

Reg. No.....

FIRST SEMESTER M.Sc. DEGREE (SUPPLEMENTARY) EXAMINATION NOVEMBER 2020

(CUCSS)

Biochemistry

BC 1C 03—METABOLISM AND CLINICAL BIOCHEMISTRY

(2013 Admissions)

Time : Three Hours Maximum : 36 Weightage

Section A

Answer any **fourteen** *questions.*
Each question carries a weightage of 1.

1. What are the differences between hexokinase and glucokinase ?
2. Outline the steps involved in alcoholic fermentation
3. What is the function of pyruvate dehydrogenase complex ?
4. Name a proteolytic enzyme and mention its function.
5. Name the ketone bodies.
6. What is the committed step in cholestrol biosynthesis ?
7. What is the action of adenosine deaminase ?
8. What is the normal value of creatinine in the blood ? What does an abnormal level of creatinine denote ?
9. Explain the biochemical defect in tyrosinemia ?
10. Differentiate between micro and macronutrients. Give examples
11. What is lactose intolerance ?
12. What are leukotrienes ?
13. Explain a transamination reaction.
14. What is the cause of metabolic acidosis ?

15. What is the significance of HMP shunt ?

16. What is HbA1c and why is it an important test for a diabetic ?

(14 × 1 = 14 weightage)

Section B

Answer any **seven** *questions.*
Each question carries a weightage of 2.

17. What is gluconeogenesis and when does it occur ?

18. Explain the significance of glyoxylate cycle.

19. Briefly describe the role of lipoproteins in the transport of lipids.

20. Describe a transmethylation reaction

21. How are ketone bodies synthesised ?

22. Write down the reactions affected by the following inhibitors. (A) Fluoride ; and (B) Iodoacetate.

23. What are the major differences between hepatitis and cirrhosis ?

24. Explain salvage pathway.

25. Give an account of testosterone imbalance in men.

(7 × 2 = 14 weightage)

Section C

Answer any **two** *questions.*
Each question carries a weightage of 4.

26. Describe the synthesis of fatty acids.

27. Give an account of urea cycle and its regulation.

28. Explain Krebs cycle.

(2 × 4 = 8 weightage)

D 93566 **(Pages : 2)** **Name.....**

Reg. No.....

FIRST SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2020

(CCSS)

Biochemistry

BCH 1C 02—BIOLOGICAL MACRO MOLECULES AND STRUCTURAL BIOLOGY

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Section A

Answer **all** *questions in 2* **or** *3 sentences.*
Each question carries 2 marks.

1. Write brief note on globosides.
2. Give the structure of any two phosphatidyl derivatives.
3. Comment on the significance of topoisomerases.
4. Differentiate between fibrous and globular proteins.
5. List out the functions of cardiolipin.
6. Differentiate between LINE and SINE.
7. Give the structure of Hyaluronic acid and heparin.
8. What is the significance of X-ray crystallography ?
9. Brief on role of carbohydrates in intracellular targeting.
10. Enumerate the functions of thromboxanes.
11. How are glycosidic bonds classified ?
12. List out the sterols in microbes.
13. List out the super secondary structures found in biological systems.
14. How are the oligiosaccharides isolated from cell membranes characterized ?
15. How are lasers useful in determination of biomolecular structure ?
16. Briefly discuss on nucleosomes.
17. Define micro RNA. List out their functions.
18. Brief on the structural characteristic of bacterial peptidoglycan.

19. What is the basic principle of electron microscope ?

20. Make a brief note on Miller indices.

(20 × 2 = 40 marks)

Section B

Answer any **five** *of the following.*
Each question carries 8 *marks.*

21. Elaborate on the purification and characterization of polysaccharides.

22. Write a brief essay on homopolysaccharides.

23. Detail on the bonds involved in stabilizing different levels of protein structure.

24. Explain the structure and function of different types of RNAs.

25. Differentiate between SEM and TEM.

26. Discuss the functions and mechanism of action of sex hormones.

27. How are leukotrienes synthesized ? What are its physiological functions ?

(5 × 8 = 40 marks)

D 93567 **(Pages : 2)** **Name.....**

Reg. No.....

FIRST SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2020

(CCSS)

Biochemistry

BCH 1C 03—MICROBIOLOGY AND IMMUNOCHEMISTRY

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Section A

Answer **all** *questions in two or three sentences.*
Each question carries 2 *marks.*

1. Give general characteristics of methanogens.
2. Write major precautions to be taken to isolate pure culture.
3. Mention the constituents of enriched medium.
4. Mention basic approaches to control food spoilage.
5. How will you measure growth of bacteria directly ?
6. Mention role of histamine in first defence of mechanism.
7. Comment on ingredients of MacConkey medium ?
8. Mention the factors affecting immunogenicity.
9. Name the major scavenger receptors in macrophages.
10. Give the structural significance of antigen binding groove of MHC class I.
11. How does CTLA-4 down regulates T-cell activation.
12. Give any *two* each of proinflammatory and anti-inflammatory cytokines.
13. Give the principle of immunoelectrophoresis.
14. Write the function of IgM.
15. Mention different subsets of T cells.
16. Define affinity maturation.

17. Differentiate affinity and avidity.

18. Give the principle of radioimmuno assay.

19. Give the application of immunohistochemistry.

20. How will you differentiate the hypersensitivity I and II?

(20 × 2 = 40 marks)

Section B

Answer any **five** *questions.*
Each question carries 8 *marks.*

21. Explain various stages of viral lytic multiplication.

22. Draw a growth curve of bacteria and describe the essential components of an ideal culture for bacterial growth ?

23. Briefly explain the merits and demerits of microbes in environment.

24. Describe the cellular events of classical complement cascade.

25. Give the structure of T cell receptor and explain its role with antigen presentation in adaptive immune response.

26. Define Agglutination. Explain various agglutination reactions.

27. Define autoimmunity and explain the proposed mechanism for induction of autoimmunity.

(5 × 8 = 40 marks)