



K22U 3606

Reg. No. : .....

Name : .....



11 2 DEC 2022

**Third Semester B.Sc. Degree (CBCSS – OBE – Regular/Supplementary/  
Improvement) Examination, November 2022  
(2019 Admission Onwards)  
GENERAL AWARENESS COURSE IN BIOTECHNOLOGY  
3A01BTC : Biophysics**

Time : 3 Hours

Max. Marks : 40

**PART – A**

Answer **each** of the following in **2 or 3** sentences. **Each** question carries  
1 mark. **(6×1=6)**

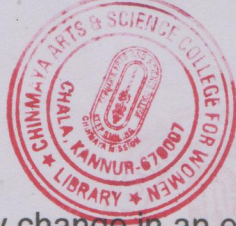
1. Define surface tension.
2. Define entropy of a system.
3. Explain integral proteins.
4. What are symports ?
5. Why histones bind with DNA ?
6. What is linking number of DNA ?

**PART – B**

Answer **any six** of the following. **Each** question carries **2** marks. **(6×2=12)**

7. What is turgor pressure ?
8. Why powdered activated carbon used for removing colour from solutions ?
9. What we study in chemical kinetics ?

P.T.O.



10. Explain the free energy change in an enzyme reaction.

11. What is structural polymorphism of DNA ?

12. What is order of a reaction ?

13. Describe the enzymes involved in super coiling of DNA.

14. Explain Phi and Xi angles in primary sequence of protein.

PART - C

Write short essay on **any four** of the following. **Each** question carries **3** marks. **(4×3=12)**

15. Why dialysis is important for the kidney patients ?

16. Describe the triplex and quadruplex DNA structures.

17. Explain the secondary and tertiary structure of t-RNA molecule.

18. Discuss structure function relationship of proteins.

19. Elaborate motif and domain structure of protein.

20. Elaborate the primary sequence of protein and its determination.

PART - D

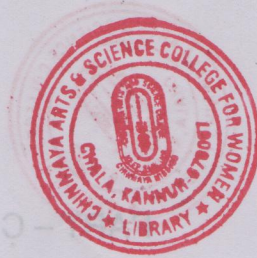
Write essay on **any two** of the following. **Each** question carries **5** marks. **(2×5=10)**

21. Discuss the basic properties of colloids.

22. Explain the four laws of thermodynamics.

23. Discuss the structure and function of plasma membrane.

24. Explain different non-canonical structure of DNA and how it is different from classical double helical structure.



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**Third Semester B.Sc. Degree (CBCSS – OBE – Regular/Supplementary/  
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(2019 Admission Onwards)  
GENERAL AWARENESS COURSE IN BIOTECHNOLOGY  
3A02BTC : Basic Concepts of Ecology**

Time : 3 Hours

Max. Marks : 40

**PART – A**

Write short notes (2 or 3 sentences) on **each** of the following. **Each** question carries 1 mark. (6×1=6)

1. Keystone species.
2. Critically endangered species.
3. Ecotypes.
4. Biotic factors.
5. Nilgiris.
6. Climax concept.

**PART – B**

Write notes on **any six** of the following. **Each** question carries 2 marks. (6×2=12)

7. Edge effect.
8. Edaphic factors.
9. Biomes.
10. Biodiversity hotspots.
11. Malthusian growth model.
12. Indicator species.
13. Top-down and Bottom-up controls.
14. Ecological indicators.

P.T.O.



## PART - C

Write short essay on **any four** of the following. **Each** question carries **3** marks. **(4×3=12)**

15. Briefly discuss on Habitat and Niche.
16. Explain Population dynamics.
17. Explain in detail nitrogen cycle.
18. Biosphere Reserves in India.
19. In-situ and Ex-situ conservation.
20. Discuss about the ecological pyramids.

## PART - D

Write essay on **any two** of the following. **Each** question carries **5** marks. **(2×5=10)**

21. Describe in detail the aquatic and terrestrial ecosystems.
22. Discuss the scope and significance of ecology.
23. Explain in detail the factors affecting population growth and the concept of metapopulation.
24. Discuss in detail the types and process of ecological succession.



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**Third Semester B.Sc. Degree (CBCSS – OBE – Regular/Supplementary/  
Improvement) Examination, November 2022  
(2019 Admission Onwards)  
CORE COURSE IN BIOTECHNOLOGY  
3B03BTC : Immunology**

Time : 3 Hours

Max. Marks : 40

**PART – A**

Answer **each** of the following in 2 or 3 sentences. **Each** question carries 1 mark :

(6×1=6)

1. Differentiate the term antibody and immunoglobulin.
2. Explain the major function of lymph node.
3. Elaborate acquired immunity.
4. Define haptens.
5. What are oncofetal antigens ? Give examples.
6. What is affinity maturation of antibody ?

**PART – B**

Answer **any six** of the following. **Each** question carries 2 marks :

(6×2=12)

7. Write about contribution of Edward Jenner in the field of immunology.
8. Explain antibody dependent cell cytotoxicity.
9. Elaborate the structure of IgM molecule.
10. What are opsonins ?
11. Explain equivalence point in antigen antibody reaction.

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12. What type of vaccine is oral polio vaccine ?

13. What are immunotoxins ?

14. Explain the antibody that are found in secretions.

### PART – C

Write short essay on **any four** of the following. **Each** question carries **3** marks :

(4×3=12)

15. Elaborate the difference between primary and secondary humoral immune responses.

16. Explain basic sign and symptoms of an inflammatory response.

17. With specific examples discuss the importance of tumor antigen in diagnosis and treatment.

18. Elaborate the role of complements in immune response.

19. Explain viral vector vaccines and DNA vaccines.

20. Difference between precipitation and agglutination reactions.

### PART – D

Write essay on **any two** of the following. **Each** question carries **5** marks : (2×5=10)

21. Discuss different types of cells involved in immune response and their specific functions.

22. Classify the hypersensitivity reactions based on the mode of action.

23. Explain the structure and functions of MHC class I and MHC class II molecule.

24. Discuss the production of monoclonal antigen by hybridoma technique and their diagnostic, therapeutic and research applications.



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**Third Semester B.Sc. Degree (CBCSS – OBE – Regular/Supplementary/  
Improvement) Examination, November 2022  
(2019 Admission Onwards)  
COMPLEMENTARY ELECTIVE COURSE IN BIOCHEMISTRY  
3C03BCH : Biochemistry – III**

Time : 3 Hours

Max. Marks : 32

**PART – A**

Very short answer questions. Answer **all** questions. **Each** question carries **1** mark. **(5×1=5)**

1. Define entropy.
2. Name the enzymes catalysing irreversible reaction in glycolysis.
3. Name two amino acids which cannot undergo gluconeogenesis.
4. Name the specific sites at which reactions of urea cycle takes place.
5. Name the major regulatory enzyme in fatty acid biosynthesis.

**PART – B**

Short answer questions. Answer **any 4**. **Each** question carries **2** marks. **(4×2=8)**

6. Write about high energy compounds with suitable examples.
7. Define standard free energy change.
8. Write about transamination reaction.
9. List the non-essential amino acids.
10. Brief on salvage pathway.
11. Write about the role of carnitine in fatty acid oxidation.

P.T.O.



## PART - C

Reg. No. : .....

Short essay questions. Answer **any 3**. **Each** question carries **3** marks. .... (3×3=9)

12. State any two laws of thermodynamics.
13. Outline glycolysis.
14. Differentiate between substrate level phosphorylation and oxidative phosphorylation.
15. Outline the breakdown of any one non-essential amino acid.
16. Mention about the regulation of fatty acid biosynthesis.

## PART - D

Write essay on **any 2** of the following questions. **Each** question carries **5** marks. (2×5=10)

17. Give a detailed account on glycogen metabolism.
18. Discuss about the biosynthesis and breakdown of any one non-essential amino acid.
19. Explain beta oxidation of fatty acids.
20. Give a detailed account of urea cycle.

## PART - B

- Short answer questions. Answer **any 4**. Each question carries **2** marks. (4×2=8)
6. Write about high energy compounds with suitable examples.
  7. Define standard free energy change.
  8. Write about transamination reaction.
  9. List the non-essential amino acids.
  10. Brief on salvage pathway.
  11. Write about the role of carnitine in fatty acid oxidation.





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**Third Semester B.Sc. Degree (CBCSS – OBE – Regular/Supplementary/  
Improvement) Examination, November 2022  
(2019 Admission Onwards)  
Complementary Elective Course in Microbiology for Biochemistry/  
Biotechnology Core  
3C03MCB : APPLIED MICROBIOLOGY – I**

Time : 3 Hours

Max. Marks : 32

**PART – A**

Answer **all** questions.

**(5×1=5)**

1. What is freezer burn ?
2. Causative organism of listeriosis.
3. Define putrefaction.
4. Who is the father of canning ?
5. What is thawing ?

**PART – B**

Answer **any four** questions.

**(4×2=8)**

6. Explain blanching.
7. Name the causative organism and pathogenesis of infectious hepatitis.
8. Comment on preservation by anaerobic conditions.
9. What is starter culture ?
10. Comment on the organism used for the industrial production of alcohol.

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(3×3=9)

Answer any three questions.

11. Write briefly on the importance of Leuconostoc in food microbiology.
12. Comment on the use of food additives in food preservation.
13. Write a short note on :
  - i) typhoid
  - ii) cholera.
14. Briefly explain the production of vinegar.
15. What is pasteurization ? What are the different types of pasteurization ?

## PART - D

Answer any two questions.

(2×5=10)

16. What are the causes of spoilage of food ?
17. What are the factors influencing the growth of micro-organisms in food ?
18. Explain the preservation of food by physical methods.
19. Explain briefly on the microbial production of
  - i) bread
  - ii) cheese.

(4×2=8)