

**FIRST SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, NOVEMBER 2020****(CBCSS)****General Biotechnology****GBT 1C 03—MICROBIOLOGY****(2019 Admissions)****Time : Two Hours and a Half****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.*

Section A*Answer any **four** questions.**Each question carries a weightage of 2.*

1. Fluorescent Microscope.
2. MRSA.
3. Chemolithotroph & Chemoorganotroph.
4. Ribotyping & Serotyping.
5. Poliomyelitis.
6. Xenobiotics.
7. Mycoplasma.

(4 × 2 = 8 weightage)**Section B***Answer any **four** questions.**Each question carries a weightage of 3.*

8. Describe any two fungal diseases in plants.
9. Explain AFM with application.
10. Different methods to measure bacterial growth.

Turn over

11. Different methods to analyze the air microflora.
12. Methods to detect MIC & Its significance.
13. Importance of yeast in food industry.
14. Distinguish simple staining and differential staining.

(4 × 3 = 12 weightage)

Section C

Answer any **two** questions.

Each question carries a weightage of 5.

15. Explain the role of soil microflora in biogeochemical cycle.
16. Explain different types of microscopy and their application.
17. Discuss different waste water treatment systems and management.
18. Discuss principles of bacterial classification and different approaches in bacterial taxonomy.

(2 × 5 = 10 weightage)

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

(CBCSS)

General Biotechnology
GBTIC02—BIOMOLECULES
(2019 Admissions)

Time : Two Hours and a Half

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.*
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Section A

*Answer any **four** questions.*

Each question carries a weightage of 2.

1. Discuss the significance of Beer-Lamberts law.
2. Mention the importance of any *two* non-protein amino acid.
3. Distinguish between enthalpy and entropy.
4. Explain the reaction catalyzed by HGPRT.
5. Distinguish between the terms 'domain' and 'motif'.
6. Explain the importance of Ramachandran plot.
7. What is the role of second messengers ?

(4 × 2 = 8 weightage)

Section B

*Answer any **four** questions.*

Each question carries a weightage of 3.

8. What are the forces that stabilize protein structure ?
9. Describe the coenzyme functions of B vitamins.
10. Write a note on MALDI-TOF.
11. Discuss the importance of any *three* phytohormones.
12. Give an idea about the structure and functions of lipids present in mammalian cell membrane.
13. Mention three different variants of electrophoresis. Discuss about their application.
14. Write a note on x-ray crystallography.

(4 × 3 = 12 weightage)

Section C

*Answer any **two** questions.*

Each question carries a weightage of 5.

15. Discuss the structure and functions of different classes of carbohydrates
16. Give a step-by step idea about the purification of a mitochondrial membrane bound enzyme.
17. Explain buffer action. Give a detailed description of physiologic buffers.
18. Write an essay on the structure of DNA and its higher order structural organization.

(2 × 5 = 10 weightage)

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

(CBCSS)

General Biotechnology

GBT IC 01—CELL BIOLOGY

(2019 Admissions)

Time : Two Hours and a Half

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.*

Section A

Answer any four questions.

Each question carries a weightage of 2.

1. Cytoplasmic inheritance.
2. Glucose transporters.
3. Properties of cancer cells.
4. Lipid raft.
5. P⁵³ as guardian of human genome.
6. Extrinsic and intrinsic protein.
7. Lysosomes.

(4 × 2 = 8 weightage)

Section B

*Answer any **four** questions.*

Each question carries a weightage of 3.

8. Discuss evolutionary origin of mitochondrion.
9. Explain various functions of endoplasmicreticulum.
10. Explain chemiosmotic theory of ATP synthesis.
11. Give an account on various microbodies present in the cell.
12. Give an account on membrane carbohydrates and their functions.
13. What is Cytoskeleton ? Describe the components of cytoskeleton.
14. Explain the working mode of TEM.

(4 × 3 = 12 weightage)

Section C

*Answer any **two** questions.*

Each question carries a weightage of 5.

15. Describe the fluid mosaic model of the membrane and explain its salient features.
16. Explain mechanisms of signal transduction.
17. Describe different cellular organelles and their function.
18. Explain Oxidative metabolism in mitochondria.

(2 × 5 = 10 weightage)

FIRST SEMESTER M.Sc. DEGREE EXAMINATION, DECEMBER 2019

(CUCSS)

General Biotechnology

GB 1C1—CELL BIOLOGY

(2010 Admissions)

Time : Three Hours

Maximum : 36 Weightage

Section A (Very Short Answers)*Answer all questions.**Each question carries weightage 1.*

1. Signal recognition particle.
2. Hsp 70.
3. 9+2 arrangement.
4. Vitronectin.
5. Occludin.
6. Cristae.
7. PTS.
8. TIC and TOC complex.
9. Microbodies.
10. Glyoxysome.

(10 × 1 = 10 weightage)

Section B (Short Answer Type Questions)*Answer any seven questions.**Each question carries weightage 2.*

11. Ras-MapK pathway.
12. Export into nucleus.
13. Cell cycle check-points.
14. Glycosylation in ER.

Turn over

15. Photoactivation in plants.
16. Karyotyping.
17. Kinetochore.
18. Ion channels.
19. Histone tails.
20. Tumor Suppressor genes.

(7 × 2 = 14 weightage)

Section C (Essay Type Questions)

Answer any two questions.

Each question carries weightage 6.

21. Describe the cell signaling pathway that acts via trimeric G-Protein .
22. Describe the mechanisms involved in formation and fusion of vesicles.
23. Describe the various components involved in cell-cell and cell-ECM contact

(2 × 6 = 12 weightage)

**FIRST SEMESTER M.Sc. (BIOTECHNOLOGY) DEGREE [NATIONAL
STREAM] EXAMINATION, DECEMBER 2019**

(CCSS)

M.Sc. Biotechnology (National Stream)

BT 104 CC—MICROBIOLOGY

(2019 Admission onwards)

Time : Three Hours

Maximum : 50 Marks

Part A*Answer any one question in about 600 words.**The question carries 10 marks.*

1. Explain in detail the different physical and chemical methods of sterilization.
2. Write an essay on biogeochemical cycles.

(1 × 10 = 10 marks)

Part B*Answer any three of the following, each in about 250 words.**Each question carries 5 marks.*

3. Write short note on bacteriophages and their life cycle.
4. Explain bacterial growth curve. What are the factors affecting bacterial growth ?
5. Discuss in detail Whittaker's classification system.
6. What are the common types of symbiosis ? What do you understand by the term "ruminant symbiosis" ?
7. With a suitable diagram explain the structure and properties of bacterial endospore.

(3 × 5 = 15 marks)

Part C*Answer all five questions, each in about 100 words.**Each question carries 3 marks.*

8. Write short note on bacterial shapes and arrangement.
9. What are DNA viruses ? Give examples.

Turn over

10. Differentiate between disinfection and antisepsis.
11. Explain differential staining with suitable example.
12. Write a note on fungi and the roles they play in human life.

(5 × 3 = 15 marks)

Part D

Write notes on each of the following in 50 words.

Each question carries 2 marks.

13. Koch's postulates.
14. Halophiles.
15. Prions.
16. Probiotics.
17. Transduction.

(5 × 2 = 10 marks)

**FIRST SEMESTER M.Sc. (BIOTECHNOLOGY) DEGREE [NATIONAL
STREAM] EXAMINATION, DECEMBER 2019**

(CCSS)

M.Sc. Biotechnology (National Stream)

BT 103 CC—BIOMOLECULES—ANALYTICAL TECHNIQUES

(2019 Admission onwards)

Time : Three Hours

Maximum : 50 Marks

Part A*Answer any one question in about 600 words.**The question carries 10 marks.*

1. Explain basic principle, instrumentation and applications of spectrophotometry.
2. Write principle and applications of PAGE, SDS-PAGE and Agarose Gel Electrophoresis.

(1 × 10 = 10 marks)

Part B*Answer any three of the following, each in about 250 words.**Each question carries 5 marks.*

3. Write principle and applications of confocal microscope.
4. Explain different membrane-based techniques for biomolecular separation.
5. Discuss on radiotracer techniques.
6. Write an overview of mass spectrometry.
7. Write principle and applications of protein micro array technique.

(3 × 5 = 15 marks)

Part C*Answer all five questions, each in about 100 words.**Each question carries 3 marks.*

8. Write general properties of fluorophores.
9. What is Atomic Force Microscopy ?

10. Write principle of Ion Exchange Chromatography ?
11. What is the working principle of centrifuges ?
12. What is radioimmunoassay ?

(5 × 3 = 15 marks)

Part D

Write notes on each of the following in 50 words.

Each question carries 2 marks.

13. Salting out process.
14. Total internal reflection.
15. Retention time.
16. Scintillation counter.
17. Southern blotting technique.

(5 × 2 = 10 marks)

**FIRST SEMESTER M.Sc. (BIOTECHNOLOGY) DEGREE [NATIONAL
STREAM] EXAMINATION, DECEMBER 2019**

(CCSS)

M.Sc. Biotechnology (National Stream)

BT 102 CC—CELL AND DEVELOPMENTAL BIOLOGY

(2019 Admission onwards)

Time : Three Hours

Maximum : 50 Marks

Part A*Answer any one question in about 600 words.**The question carries 10 marks.*

1. Describe the organization of a chromosome. Write a note on heterochromatinization.
2. Describe the structure of a nuclear pore complex. How are materials imported and exported into the nucleus.

(1 × 10 = 10 marks)

Part B*Answer any three question in about 250 words.**Each question carries 5 marks.*

3. Define the growth regulators in the different stages of plant development.
4. Write a note on the structure of the Chloroplast.
5. Describe the signaling mechanism through the serine threonine pathway.
6. What is ERGIC.
7. Describe endocytosis.

(3 × 5 = 15 marks)

Part C*Answer all the five questions, each in about 100 words.**Each question carries 3 marks.*

8. What are the germ layers ?
9. With an example, explain the role of an oncogene.

Turn over

10. Write a note on ATP synthase.
11. What is immunofluorescence ?
12. What are is the role of cytochrome C in apoptosis.

(5 × 3 = 15 marks)

Part D

Write notes on each of the following in 50 words.

Each question carries 2 marks.

13. P53.
14. Selectin.
15. Plasmodesmata.
16. Density gradient centrifugation.
17. SNARES.

(5 × 2 = 10 marks)

**FIRST SEMESTER M.Sc. (BIOTECHNOLOGY) DEGREE [NATIONAL
STREAM] EXAMINATION, DECEMBER 2019**

(CCSS)

M.Sc. Biotechnology (National Stream)

BT 101 CC—BIOCHEMISTRY

(2019 Admission onwards)

Time : Three Hours

Maximum : 50 Marks

Part A*Answer any one question in about 600 words.**The question carries 10 marks.*

1. Derive the Michaelis-Menten equation. Explain the significance of V_{\max} and K_m values.
2. Describe the mechanism of photosynthesis in detail.

(1 × 10 = 10 marks)

Part B*Answer any three of the following, each in about 250 words.**Each question carries 5 marks.*

3. Discuss about the maintenance of blood pH.
4. State the importance of Ramachandran plot.
5. Write a short note on enzyme inhibition.
6. Describe different types of DNA.
7. Explain β -oxidation of fatty acids.

(3 × 5 = 15 marks)

Part C*Answer all five questions, each in about 100 words.**Each question carries 3 marks.*

8. Comment on the properties of water.
9. Explain any two techniques used in protein purification.

Turn over

10. What are isozymes ? Explain with examples.
11. State the difference between the structure of glycogen and amylose.
12. Explain the role of lipids in membrane.

(5 × 3 = 15 marks)

Part D

Write notes on each of the following in 50 words.

Each question carries 2 marks.

13. Free energy concept.
14. Zymogens.
15. Buffers.
16. Chaperones
17. Glycolipids.

(5 × 2 = 10 marks)