# FIRST SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

Microbiology

## MBG 1C 04—AGRICULTURAL MICROBIOLOGY AND PLANT PATHOLOGY

(2019 Admission onwards)

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. *The instruction if any, to attend a minimum number of questions from each sub section/sub part/ sub division may be ignored.*

4. *There will be an overall ceiling for each Section/Part that is equivalent to the maximum weightage of the Section/Part.*

*Where ever needed answers must be supported by structural illustrations and diagrams*

### Section A (Short Answer Type)

*Answer any* **four** *of the following.*
*Each question carries 2 weightage.*

1. Crown gall.

2. SAR of plants.

3. Hartig net.

4. R genes.

5. Dinitogenase reductase.

6. Biopesticides.

(4 × 2 = 8 weightage)

## Section B (Short Essay Type Questions)

*Answer any* **four** *of the following.*
*Each question carries 3 weightage.*

Comment on the following :

7.  Diazotrophs.

8.  Rhizosphere.

9.  GM crops and its significance.

10. Biofertilizer and its importance in agriculture.

11. Ratoon stunting of sugarcane.

12. Plant disease control measures.

(4 × 3 = 12 weightage)

## Section C (Essay Type Questions)

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

13. What is rhizosphere effect ? Discuss the role of plant roots and micro-organisms in this mutulistic interaction.

14. Discuss the etiology, symptoms, epidemiology and control measures of BLB of rice and rice tungro diseases.

15. Write a note on biocontrol agents for management of plant diseases.

16. Discuss the classification of mycorrhizae. Write on the significance of mycorrhizae in agriculture.

(2 × 5 = 10 weightage)

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Name...........................................

Reg. No....................................

# FIRST SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

## (CBCSS)

### Microbiology

### MBG1C03—ENVIRONMENTAL AND SANITATION MICROBIOLOGY

(2019 Admission onwards)

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. *The instruction if any, to attend a minimum number of questions from each sub section/sub part/ sub division may be ignored.*

4. *There will be an overall ceiling for each Section/Part that is equivalent to the maximum weightage of the Section/Part.*

### Section A (Short Answer Type Questions)

*Answer any **four** of the following.*
*Each question carries 2 weightage.*

1. Antagonism.

2. BOD.

3. Transducer.

4. Recalcitrants.

5. Air sanitizes.

6. ATP Testing.

(4 × 2 = 8 weightage)

**Turn over**

## Section B (Short Essay Type Questions)

*Answer any* **four** *of the following.*
*Each question carries 3 weightage.*

7. Draw and state importance of Carbon cycle.

8. Electrostatic precipitation advantages and disadvantages.

9. Draw biogas plant and label.

10. Stages of Anaerobic digestion in biogas plant.

11. Biodegrdation of petroleum.

12. Principle of gradient centrifugation.

(4 × 3 = 12 weightage)

## Section C (Essay Type questions)

*Answer any* **two** *of the following.*
*Each question carries 5 weightage.*

13. Give an account about Marine pollution and Air pollution.

14. Brief about Biosensors.

15. Biofouling and causative agents, remedies.

16. Explain principle and procedure of microbial analysis of water.

(2 × 5 = 10 weightage)

Name.............................................

Reg. No....................................

# FIRST SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

Microbiology

## MBG 1C 02—BIOPHYSICS AND INSTRUMENTATION

(2019 Admission onwards)

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. *The instruction if any, to attend a minimum number of questions from each sub section/sub part/ sub division may be ignored.*

4. *There will be an overall ceiling for each Section/Part that is equivalent to the maximum weightage of the Section/Part.*

   *Where ever needed answers must be supported by structural illustrations and diagrams.*

### Section A (Short Answer Type)

*Answer any* **four** *of the following*
*Each question carries 2 weightage.*

1. HPLC.

2. Peptide linkage.

3. Ultra filtration.

4. Confocal Microscopy.

5. Flame photometry.

6. Tortion angle.

(4 × 2 = 8 weightage)

## Section B (Short Essay Type Questions)

*Answer any* **four** *of the following.*
*Each question carries 3 weightage.*

Comment on the following :

7. Brief account on the concept of Entropy and Enthalpy.

8. Differentiate Alpha helix and Beta sheets.

9. Give details on DNA-Histone interaction.

10. Differentiate SDS and Native PAGE.

11. Dialysis and its applications in biology.

12. Give details on the principle of X-Ray diffraction technique.

$(4 \times 3 = 12 \text{ weightage})$

## Section C (Essay Type Questions)

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

13. Write detail on principle, design and applications of various spectroscopy techniques.

14. Give details on various physico-chemical forces seen in bio molecules.

15. Describe on protein- drug interactions studies using databases and PMF techniques.

16. Give details on various centrifugation techniques.

$(2 \times 5 = 10 \text{ weightage})$

# FIRST SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

## (CBCSS)

### Microbiology

### MBG 1C 01—GENERAL BIOCHEMISTRY AND MICROBIAL METABOLISM

#### (2019 Admission onwards)

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. *The instruction if any, to attend a minimum number of questions from each sub section/sub part/ sub division may be ignored.*

4. *There will be an overall ceiling for each Section/Part that is equivalent to the maximum weightage of the Section/Part.*

*Wherever needed answers must be supported by structural illustration and diagrams.*

### Section A

*Short answer type questions.*
*Answer any* **four** *of the following.*
*Each question carries 2 weighatge.*

1. Glycoproteins.

2. Substrate level phsphorylation.

3. Transamination.

4. Omega oxidation of fatty acids.

5. Degradation of cytocine.

6. Immobilized enzymes.

(4 × 2 = 8 weightage)

## Section B (Short Essay Type Questions)

*Answer any* **four** *of the following.*

*Each question carries 3 weighatge.*

7. Examine the structural classification of fatty acids.

8. Illustrate the biochemical mechanism of anaerobic respiration.

9. Discuss the transmethylation and decarboxylations in aminoscids.

10. Narrate the major steps in the alpha oxidation of fatty acids.

11. Examine the biochemical aspects of salvage pathway in nucleic acid metabolism.

12. Derive Michaeis-Menton equation of enzyme action.

$(4 \times 3 = 12$ weightage)

## Section C (Essay Type Questions)

*Answer any* **two** *of the following.*

*Each question carries 5 weightage.*

13. Elaborate the classification of the vitamins and hormones with appropriate examples.

14. Illustrate the major biochemical mechanisms involved in electron transport chain.

15. What are glucogenic and ketogenic amino acids ? Add a short note on the major disorders in amino acid metabolism.

16. Elaborate in detail the major approaches in the purification of enzymes.

$(2 \times 5 = 10$ weightage)

# FIRST SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2021

## (CCSS)

### Microbiology

### MBG 1C 03—MOLECULAR BIOLOGY AND RDNA TECHNOLOGY

### (2019 Admissions)

Time : Three Hours                                                        Maximum : 80 Marks

## Section A

*Write about each of the following in two* **or** *three sentences.*
*Each question carries 2 marks.*

1. Ribozyme.

2. Homopolymer tailing.

3. RISC complex.

4. Realtime PCR.

5. Radiolabelled probes.

6. Electroporation.

7. IS element.

8. Holiday junction.

9. DNA methylation.

10. Molecular marker.

11. RNA capping.

12. Protein folding.

13. Immortalization.

14. Src kinase.

15. Nucleoprotiens.

16. Gene Clusters.

**Turn over**

17. C value paradox.

18. RNA instability.

19. Composite transposon.

20. miRNA.

(20 × 2 = 40 marks)

## Section B

*Write note on or discuss any* **five** *of the following.*
*Each question carries 8 marks.*

21. DNA sequencing methods.

22. Apoptotic pathways.

23. Define Mutation. Explain different types of mutations and mutagens.

24. Production of any *one* recombinant human protein.

25. Explain the structure and regulation ofTrp operon and describe how it differ from Lac operon.

26. Prokaryotic transcription.

27. Double helical structure of DNA.

(5 × 8 = 40 marks)

# FIRST SEMESTER P.G. DEGREE EXAMINATION
## NOVEMBER 2021

(CCSS)

Microbiology

MBG 1C 02—MICROBIAL ENZYMES AND SECONDARY METABOLISM

(2019 Admissions)

Time : Three Hours                                                                 Maximum : 80 Marks

### Section A

*Write each of the following in two **or** three sentences.*
*Each question carries 2 marks.*

1.  Saccharase.

2.  Pectic enzymes.

3.  ACE Inhibitors.

4.  Beta lactam antibiotics.

5.  Importance of the chirality in drugs.

6.  Ergotism.

7.  Myrbetriq.

8.  Hydroxamates.

9.  Nisin A.

10. Polypeptide antibiotics.

11. What are the side effects of High- fructose com syrup ?

12. Sulphite liquor.

13. Acyclovir.

14. Dill Pickle

15. Cry proteins.

16. Notatin.

17. Tetanus toxin.

18. Endopeptidase.

**Turn over**

19. Epoxydation.

20. Brewing.

<div align="right">(20 × 2 = 40 marks)</div>

## Section B

*Write notes on or discuss any* **five** *of the following.*
*Each question carries 8 marks.*

21. Discuss about the various secondary metabolites which are commercially produced for human use and also compare the primary and secondary metabolites.

22. Comment on the types of reaction in the Biotransformation of Steroids. Add a note on the differences of sterols and steroids.

23. Write importance of production medium in antibiotic production by micro-organisms with an example.

24. Compare the applications of amylase and amylo glucosidase in food processing.

25. Give details on Secondary Metabolites & its Characteristics.

26. Give details on Bioluminescence.

27. Write the applications of enzymes in preparing anti-cancer drugs.

<div align="right">(5 × 8 = 40 marks)</div>

# FIRST SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2021

(CCSS)

Microbiology

## MBG 1C 01—MICROBIAL PHYSIOLOGY AND MICROBIAL GENETICS

(2019 Admissions)

Time : Three Hours                            Maximum : 80 Marks

### Section A

*Write about each of the following in 2 **or** 3 sentences.*
*Each question carries 2 marks.*

1. Generation time.

2. Cyclic photophosphorylation.

3. ABC transporters.

4. Quorum sensing.

5. Distinguish between Photoautotrophs and Chemoheterotrophs.

6. Insertion sequences.

7. Stickland reaction.

8. Siderophores.

9. Lytic cycle of transduction.

10. Facilitated diffusion.

11. Pentose phosphate pathway.

12. Heat shock proteins.

13. PTS.

14. Death phase of bacterial growth.

15. Compatible solutes.

16. Diagrammatically represent Replica plating technique.

**Turn over**

17. SOS-response.

18. Moist heat sterilization.

19. Photoreactivation.

20. Hfr conjugation.

(20 × 2 = 40 marks)

## Section B

*Write notes on or discuss any* **five** *of the following.*
*Each question carries 8 marks.*

21. Explain TCA cycle. Mention the number of ATP obtained from TCA cycle.

22. Describe the mechanism involved in bacterial transformation.

23. Describe Calvin cycle in detail.

24. Define Chemotaxis. Briefly describe the mechanism involved.

25. Explain the different methods of physical control of microbial growth.

26. Describe the different types of continuous culture of micro-organisms.

27. Explain different types of mutations with examples.

(5 × 8 = 40 marks)