C 22577 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER M.Sc. DEGREE [REGULAR/SUPPLEMENTARY] EXAMINATION, APRIL 2022

(CBCSS)

Microbiology

MBG4E07—BIO-STATISTICS AND BIO-INFORMATION

(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. What are the applications of *t*-Test ?
2. What is regression ? What is its application ?
3. Make a comparison between EBML and TrEMBL.
4. What are the applications of multiple sequence alignment ?
5. Write a brief account on substitution matrices.
6. Make a comparison between BLAST and FASTA.

(4 × 2 = 8 weightage)

Section B (Short Essay Type Questions)

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

7. Write a brief account on ANOVA.
8. Explain the theories of probability.
9. Make an account on the types of correlation.
10. What is sequence alignment ? Make a comparison between global and local alignments.
11. Write a short note on protein secondary structure prediction programs.
12. What is standard deviation ? Mention its application in biological research.

(4 × 3 = 12 weightage)

Section C (Essay Type Questions)

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

13. Write a detailed account on measures of dispersion.
14. What is UPGMA ? Explain the steps involved in phylogenetic tree construction.
15. What are molecular databases ? Give a detailed account on nucleotide and protein databases.
16. Explain the methodology and applications of FASTA.

(2 × 5 = 10 weightage)

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FOURTH SEMESTER M.Sc. DEGREE [REGULAR/SUPPLEMENTARY] EXAMINATION, APRIL 2022

(CBCSS)

Microbiology

MBG 4E 06—BIOSAFETY, BIOETHICS AND IPR

(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 illustrations and diagrams

Section A (Short Answer Type Questions)

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

1. Biohazard.
2. Biosafety cabinet.
3. Trademark.
4. Biopiracy.
5. ACC.
6. WTO.

(4 × 2 = 8 weightage)

Turn over

Section B (Short Essay Type Questions)

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

7. Enlist the Steps for filling a patent application.
8. Gene technology act.
9. Write a short note on GATT.
10. Conservation strategies for seed gene bank.
11. Impact of GM crops on biodiversity.
12. What are the Good laboratory practice principles.

(4 × 3 = 12 weightage)

Section C (Essay Type Questions)

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

13. Discuss International conventions for the protection of new varieties.
14. Explain plant breeder's right and add a note on its advantage and disadvantages.
15. What are the ethical issues of the Human Genome Project.
16. Write a note on GMP and GLP.

(2 × 5 = 10 weightage)

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FOURTH SEMESTER M.Sc. DEGREE [REGULAR/SUPPLEMENTARY] EXAMINATION, APRIL 2022

(CBCSS)

Microbiology

MBG4E05—GENETIC ENGINEERING

(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.*

Part A

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

Comment on the following :

1. Restriction enzymes.
2. cDNA.
3. FISH.
4. Ti plasmid.
5. Microarrays.
6. Codon optimization.

(4 × 2 = 8 weightage)

Part B

Answer any **four** *questions.*
Each carries a weightage of 3.

Write briefly on the following :

7. Genomic library.
8. Linkers and adaptors.
9. Probes.
10. Colony hybridisation.
11. Site directed mutagenesis.
12. RFLP.

(4 × 3 = 12 weightage)

Part C

Answer any **two** *questions.*
Each carries a weightage of 5.

13. Discuss about various cloning vectors used in genetic engineering.
14. What is PCR ? Describe the requirements and procedure of PCR technique.
15. Discuss about the different types of blotting techniques in genetic engineering.
16. Describe the various methods for the introduction of recombinant DNA into host cell.

(2 × 5 = 10 weightage)

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FOURTH SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, APRIL 2022

(CBCSS)

Microbiology

MBG 4E 04—MICROBIAL BIO-TECHNOLOGY

(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.*

Answers must be supported by structural illustrations and diagrams wherever needed.

Section A (Short Answer Questions)

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

1. Oil spill degrading bacteria.
2. Uses of thermophilic organisms.
3. Mycorrhiza.
4. Biopharming.
5. Xenobiotics.
6. Uses of microbial desulphurization.

(4 × 2 = 8 weightage)

Section B (Short Essay Type Questions)

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

Each question carries 3 *weightage.*

7. What is Microbial surfactants ?
8. What are microbial insecticides and their advantages ?
9. Briefly describe advantages of recombinant vaccines.
10. Elaborate Lumac system.
11. Explain the role of *Pseudomonas* in bioremediation.
12. Explain microcarrier and its advantages in cell immobilization.

(4 × 3 = 12 weightage)

Section C (Essay Type Questions)

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

Each question carries 5 *weightage.*

13. Explain ATPase based quantitation.
14. Analyze the challenges in gene therapy.
15. Describe microbial biotransformation.
16. Describe the features of bioreactor design for animal cell culture.

(2 × 5 = 10 weightage)

C 21075 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2022

(CCSS)

Microbiology

MBG 4E 07—MODERN TRENDS IN DIAGNOSTICS MICROBIOLOGY AND NANO-TECHNOLOGY

(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. LPCB staining.
2. FISH.
3. Flow cytometry.
4. Gene therapy.
5. Chemiluminescence immunoassay.
6. RT PCR.
7. Oxidase test.
8. Personalised medicine.
9. ELISA.
10. Acid fast staining.
11. Fluorescent antibody technique.
12. Western blot.
13. Germ tube test.
14. PFGE.
15. Precipitation reaction.
16. Citrate Utilization test.

17. Radial immunodiffusion.
18. Nanoparticles.
19. TSI agar.
20. RAPD.

(20 × 2 = 40 marks)

Section B

Write notes on or discuss any **five** *of the following.*

Each question carries 8 *marks.*

21. Write the principle and applications of PCR
22. Give an account on agglutination reactions. List the features of antigen-antibody reactions.
23. Discuss the importance of nanobiotechnology in healthcare.
24. Discuss the various biochemical tests and microscopic methods used in the identification of bacteria
25. Give an account on flow cytometric assays.
26. Explain the principle, procedure and uses of RIA
27. Explain the molecular diagnosis of HIV

(5 × 8 = 40 marks)

C 21074 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2022

(CCSS)

Microbiology

MBG 4E 05—ANTIBIOTIC ACTION AND RESISTANCE

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

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

1. Write the names of any *two* antiviral drugs and the mechanism of action.
2. Role of transposons in drug resistance.
3. Quinolones.
4. MDRTB.
5. Structural analog.
6. Minimum inhibitory concentration.
7. What is the mechanism of action of amoxicillin.
8. What are Semisynthetic antibiotic ? Write any *one* example.
9. Broad spectrum antibiotics.
10. Therapeutic index.
11. Static agents.
12. Cephalosporins.
13. Grey baby syndrome.
14. Plasma membrane receptors.
15. Pili.
16. Biofilm and antibiotic resistance.

17. Anti-malarial drugs and their mode of action.

18. Bacteriostatic drugs in tuberculosis.

19. Penicillinase.

20. Drug discovery.

(20 × 2 = 40 marks)

Part B

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

21. Methodology in drug discovery research.

22. Mechanism of action of major antibiotics.

23. What are the different classes of antibiotics ? Explain with example for each.

24. Explain multi drug resistant TB and its clinical features. Also explain the treatment.

25. Explain different targets on bacteria for antibiotics.

26. Explain MRSA and its problems.

27. Discuss on the emergence of antibiotic resistance strain and the molecular mechanism involved in antibiotic resistance.

(5 × 8 = 40 marks)

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FOURTH SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(CCSS)

M.Sc. Microbiology

MBG 4E 08—MICROBIAL PEST CONTROL

(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. NPV.
2. Safety of Bt bioinsectcide.
3. δ-endotoxins of *Bacillus thuringensis.*
4. Advantages of microbial biopesticides over chemical pesticides.
5. Baculoviruses.
6. Entomopathogenic fungi.
7. Wettable powder formulation of *Bt.*
8. Insecticidal crystal proteins.
9. Biological agents used as herbicides.
10. Ecotoxicology of *Bacillus thuringensis.*
11. Insecticidal specificities of cry toxins.
12. Flourescent pseudomonads.
13. *Cyt* proteins.
14. Microencapsulated formulation of *Bt.*
15. Particle gun method.
16. *Bacillus sphaericus.*

17. GM cotton.

18. *Verticillium lecanii.*

19. Bacterial larvicides.

20. Integrated pest management.

(20 × 2 = 40 marks)

Section B

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

21. Discuss the characteristics of Microbial insecticide formulations and list out commonly used formulations of *Bacillus thuringensis.*

22. Briefly discuss about insect resistance to *Bt* toxins and different strategies for resistance management.

23. Discuss about the importance of Baculoviruses in pest control. Explain briefly about genetically modified baculoviruses.

24. Explain the production of *Bacillus thuringensis* by fermentation technology.

25. Describe the production of genetically engineered crop plants carrying *Bt* toxin.

26. Discuss the insecticidal activity and classification of crystal proteins of *Bacillus thuringensis.*

27. Discuss briefly about biofungicides, its production and formulation.

(5 × 8 = 40 marks)