D–1649

Sub. Code
36411

DISTANCE EDUCATION

M.Sc. (Microbiology) DEGREE EXAMINATION, MAY 2023.

First Semester

GENERAL MICROBIOLOGY

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. Baker's yeast

2. Carl Woese three domain concept

3. SEM

4. Crystal violet

5. Enriched media

6. Auxenic culture

7. Fimbriae

8. *Anabaena azollae*

9. Icosahedral viruses

10. Viroids

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).

11. (a) Write short on Whittaker's Five —Kingdom concept.

Or

(b) Write in brief about classification of fungi.

12. (a) Give short notes on applications of confocal microscopy.

Or

(b) Describe the differential staining methods.

13. (a) Add short notes on types of culture media.

Or

(b) Briefly explain about various sterilization methods.

14. (a) Give brief note on chemical composition of capsule.

Or

(b) Describe the structural characteristics of protozoa.

15. (a) Give an account on classification of virus.

Or

(b) Write briefly about viral capsids and their arrangements.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Give detailed account on classification of bacteria according to Bergey's manual

17. Write in detail about Fluorescent microscope

18. Give elaborate notes on factors influencing microbial growth

19. Discuss about the fluid mosaic model of plasma membrane

20. Write detailed account lysogenic life cycle of viruses.

———————

D–1650

Sub. Code
36412

DISTANCE EDUCATION

M.Sc. (Microbiology) DEGREE EXAMINATION, MAY 2023.

First Semester

MICROBIAL BIOCHEMISTRY

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Peptidoglycan

2. Glyoxylate cycle

3. Quaternary structure of proteins

4. Lipid peroxidation

5. Degradation of purins

6. Chemical nature of enzyme

7. Allosteric inhibition

8. Abzyme

9. Bacteriochlorophyll

10. Vitamin as co-enzymes

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).

11. (a) Give a short note on polysaccharides.

Or

(b) Explain briefly about Entner Doudroff pathway.

12. (a) Discuss briefly about the classification based on structure of amino acids

Or

(b) Add a short note on classification of fatty acids.

13. (a) Write briefly about the structure and synthesize of purines and pyrimidines.

Or

(b) Explain about reversible and irreversible inhibition.

14. (a) Describe Michaelis-Menten hypothesis.

Or

(b) Give a short note on phosphorescence, rhodopsin and phycobiliproteins.

15. (a) Write briefly about secondary metabolites.

Or

(b) Give a short note on *Salmonella* toxin.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Give a detailed account on classification of carbohydrates.

17. Describe elaborately about the phospholipid and cholesterol synthesis in E.*coli*.

18. Discuss in detail about enzyme specificity and co-enzymes.

19. Write in detail about biosynthesis and regulation of penicillin and streptomycin.

20. Write elaborately about the classification, properties and function of vitamins.

———————

D–1651

Sub. Code
36413

DISTANCE EDUCATION

M.Sc. (Microbiology) DEGREE EXAMINATION, MAY 2023.

First Semester

MICROBIAL PHYSIOLOGY

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Generation time

2. Micro elements

3. Proton motive force

4. Carotenoids

5. Photophosporylation

6. Aerobic transition

7. Acid tolerance

8. Nitrification

9. Energy bond

10. Osmosis

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).

11. (a) Write brief note on different phases of bacterial growth.

Or

(b) Give a brief account on nutritional diversity in bacteria.

12. (a) Discuss the oxygenic photosynthesis in bacteria.

Or

(b) Briefly explain about structure of chlorophyll pigments.

13. (a) Write about osmotic stress and osmoregulation.

Or

(b) Illustrate briefly about TCA cycle.

14. (a) Briefly explain about electron transport in bacteria.

Or

(b) Write shortly about enthalpy reaction.

15. (a) Write a brief account on membrane diffusion.

Or

(b) Describe about quorum sensing mechanism in pathogenic bacteria.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Discuss in details about factors affecting microbial growth.

17. Write elaborate note on reductive acetyl COA pathway.

18. Explain in detail about the symbiotic nitrogen fixation by bacteria.

19. Describe in detail about artificial electron donors and uncouplers.

20. Elaborately explain about transport across membrane.

———————

D–1652

Sub. Code
36421

DISTANCE EDUCATION

M.Sc. (Microbiology) DEGREE EXAMINATION, MAY 2023.

Second Semester

MICROBIAL GENETICS

(CBCS 2018-19 Academic Year onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. Mutagenesis

2. Alkylation

3. Recombinational repair

4. Homologous recombination

5. DNA mobilization

6. Hfr conjugation

7. Positive regulation

8. Col plasmids

9. Integrons

10. Tn3 transposons

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b)

11. (a) Write a short note on mutation rate and its determination.

Or

(b) Give a brief account on physical mutagens.

12. (a) Write briefly about Nucleotide excision repair pathway.

Or

(b) Discuss about molecular mechanism for site specific recombination.

13. (a) Describe about conjugation by *E. coil* F factor.

Or

(b) Add a short note on transformation by inducing artificial competence.

14. (a) What are all the regulation of bacterial gene expression?

Or

(b) Discuss about arabinose operon and its regulation.

15. (a) Write a short note on transfer o plasmid DNA.

Or

(b) Give a brief note on genetic organization and mechanism of transposition of Tn5 and related transposons.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Write in elaborately about the different types of mutagens.

17. Explain in detail about DNA damages.

18. Give a detailed account on structure of F-factor and regulation of F-factor fertility

19. Describe in detail about Lac-operon concept.

20. Discuss elaborately about detection and purification of plasmid DNA.

———————

D–1653

Sub. Code
36422

DISTANCE EDUCATION

M.Sc. (Microbiology) DEGREE EXAMINATION, MAY 2023.

Second Semester

MOLECULAR BIOLOGY & rDNA TECHNOLOGY

(CBCS 2018-19 Academic Year onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. What are heteroduplex DNA?

2. What is the role of helicase in DNA replication?

3. Explain wobble hypothesis.

4. What are introns and Exons?

5. What is the purpose of polyadenylation in mRNA?

6. What are the three important characteristics of cloning vector?

7. Define genomic library.

8. Define recombinant vaccine.

9. Define Primers.

10. What is SiRNA?

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b)

11. (a) Explain the salient features of Watson crick model of DNA.

Or

(b) Describe the significant enzymatic activities of DNA polymerases.

12. (a) Explain the post transcriptional modification of mRNA.

Or

(b) Explain the characteristic features of P^{BR} 322 with neat diagram.

13. (a) Explain the commercial production of recombinant human insulin.

Or

(b) Write short notes on alpha complementation.

14. (a) Outline the steps involved in the construction of cDNA library.

Or

(b) Elaborate the common physical mapping methods of genome.

15. (a) Describe the gene transfer by microprojectile bombardment method.

Or

(b) Explain the principle and application of DNA microarray technique.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Describe in detail the secondary and tertiary structure of tRNA with suitable illustrations.

17. Elaborate the transcription process in prokaryotes. Add a note on inhibitors of transcription.

18. Enumerate the various phenotypic screening methods for isolation of recombinant clones

19. Explain in detail the principal, types of PCR and its clinical applications.

20. Discuss in detail the different strategies for gene silencing and its applications.

———————

D-1654

Sub. Code
36423

DISTANCE EDUCATION

M.Sc. (Microbiology) DEGREE EXAMINATION,
MAY 2023.

Second Semester

FOOD AND DAIRY MICROBIOLOGY

(CBCS 2018-19 Academic Year onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. Define Redox potential.

2. How does relative humidity affect food storage?

3. Name the microorganism present in fish.

4. Define Mycotoxin.

5. Differentiate acidophilus milk from regular milk.

6. What are single cell proteins? Give examples?

7. Write short notes on probiotics.

8. What is the industrial source of cellulase enzymes?

9. Define canning.

10. What is BIS mark in food safety?

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b)

11. (a) Explain the role of pH on the growth of microorganism.

Or

(b) How does gaseous temperature affect the growth of microorganism?

12. (a) Give a brief account on Staphylococcal poisoning.

Or

(b) Explain the physical methods of preservation of food.

13. (a) Outline the steps involved in the production of Cheddar cheese.

Or

(b) Write short notes on fermented alcoholic beverages.

14. (a) Discuss the primary and secondary virulence factors of pathogenic *E. coli*.

Or

(b) Write short notes on microbial production of amylases.

15. (a) Explain the significance of HACCP in food industry.

Or

(b) Discuss the sanitizing action of electrolyzed oxidizing water in food industry.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Discuss in detail the various intrinsic factors influencing the growth of microorganism in food.

17. Elaborate in detail about the different types of spoilage in canned foods.

18. Discuss in detail about the production of SCP with respect to microbes used, substrates and environmental conditions.

19. Enumerate and explain the different techniques used for the detection of microbial contamination in food.

20. Describe in detail the industrial production of microbial proteases with a neat flowchart.

———————

D–1655

Sub. Code
36431

DISTANCE EDUCATION

M.Sc. (Microbiology) DEGREE EXAMINATION, MAY 2023.

Third Semester

IMMUNOLOGY

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Granulocytes
2. Innate immunity
3. Haemokines
4. Adjuvants
5. Haptens
6. Agglutination
7. MHC class II molecules
8. Rheumatoid Arthritis
9. HLA tissue typing
10. Attenuated vaccine

SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL the questions, choosing either (a) or (b).

11. (a) Briefly explain about primary lymphoid organs.

Or

(b) Differentiate innate and acquired immunity.

12. (a) Write short note on note cell mediated immunity.

Or

(b) Describe about maturation and differentiation of B-cell.

13. (a) Add short note on IgG immunoglobulin.

Or

(b) Write in detail about immunoglobulin genes for structure and organization.

14. (a) Give an account on antigen processing and presentation.

Or

(b) Explain about MHC molecule structure and interaction with peptides.

15. (a) Write in detail about autoimmune disorders.

Or

(b) Briefly explain about hybridoma technology.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Write in detail about humoral immunity.

17. Discuss about immunoglobulin types and functions.

18. Elaborately explain about classical pathway of complement fixation.

19. Discuss in detail about type III and IV hypersensitivity reactions.

20. Explain about application of stem cells.

———————

D–1656

Sub. Code
36432

DISTANCE EDUCATION

M.Sc. (Microbiology) DEGREE EXAMINATION, MAY 2023.

Third Semester

MEDICAL MICROBIOLOGY

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Define Nosocomial infection.

2. What is transient microflora? Give examples.

3. What is Bacitracin susceptibility test?

4. What is meant by facultative anaerobic bacteria?

5. What are Zoonotic infections?

6. Define Mucormycosis

7. What is the cytopathic effect of virus?

8. List the clinical symptoms of Amoebiasis.

9. What is the main cause of encephalitis?

10. What are the modes of transmission of Ebola?

SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL the questions, choosing either (a) or (b).

11. (a) Explain the importance of *Lactobacillus* species in vagina.

Or

(b) Discuss the various mode of collection of clinical samples.

12. (a) Explain the principle and interpretation of Widal test.

Or

(b) Elucidate the causative agents and clinical symptoms of *Bordetella pertussis.*

13. (a) Describe the general features and pathogenesis of *corynebacterium diphtheria.*

Or

(b) Discuss the clinical stages and symptoms of Measles.

14. (a) Briefly explain the pathogenesis and laboratory diagnosis of polio virus.

Or

(b) Give a brief account on opportunistic fungal infection.

15. (a) Explain briefly how antibiotics are effective against bacterial infections but ineffective against viral infections.

Or

(b) Outline the life cycle of *Plasmodium falciparum*. Which stage is *Plasmodium* is infective to human?

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Give a detailed account on normal microflora in human and their beneficial effect with suitable examples.

17. Describe the morphological characteristics, virulence factors, pathogenesis and diagnosis of *Mycobacterium leprae*.

18. Elaborate in detail the etiological agent, transmission and pathogenesis of infectious hepatitis.

19. Describe the mechanism of action of penicillin and chloromphenicol on bacteria.

20. Give a comprehensive overview on national programmes for the prevention of infectious disease.

———————

D–1657

Sub. Code
36433

DISTANCE EDUCATION

M.Sc. (Microbiology) DEGREE EXAMINATION, MAY 2023.

Third Semester

ENVIRONMENTAL AND AGRICULTURAL MICROBIOLOGY

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Food chain
2. Define biotic and abiotic environment
3. Eutrophication
4. Vermicomposting
5. Activated sludge
6. Biomagnifications
7. Clay soil
8. VAM
9. Phenolic compounds
10. Grassy shoot of sugarcane

SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL the questions, choosing either (a) or (b).

11. (a) Write short note on characteristics of ecosystem.

Or

(b) Give an account on food chains and food webs.

12. (a) Give an account on primary treatment of liquid waste.

Or

(b) Briefly explain about mining of copper from low grade ores.

13. (a) Write in detail about structure of soil.

Or

(b) Add short notes on nitrogen fixation by symbiotic microbes.

14. (a) Give an account on carbon cycle.

Or

(b) Write brief note on sulfur cycle.

15. (a) Write an account on role of enzyme and toxins in plant protection.

Or

(b) Add a brief note on epidemiology and management of bacterial blight of paddy.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Write elaborate note on causes of eutrophication in water bodies.

17. Explain in detail about solid waste management.

18. Discuss about the secondary waste treatment of liquid waste.

19. Describe in detail about biochemical defense mechanism in plants.

20. Elaborate about chemical and biological control of plant diseases.

———————

D–1658

Sub. Code
36441

DISTANCE EDUCATION

M.Sc. (Microbiology) DEGREE EXAMINATION, MAY 2023.

Fourth Semester

BIOPROCESS TECHNOLOGY

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

Draw diagrams if necessary

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. What is the importance of chromatography?
2. Mention any three mineral sources used in fermentation.
3. What are the different types of bio reactors?
4. How economical is Bio process technology?
5. Define dual and multiple fermentations.
6. What is Whole Broth Processing?
7. What are the steps to be taken for medium optimization?
8. Mention some sterilizing agents used in fermentation.
9. What are the commercial products of Bioprocess technology?
10. What are the steps for purification of fermentation products?

SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL the questions, choosing either (a) or (b).

11. (a) Explain in brief about aseptic operation and containment?

Or

(b) What are the advantages and disadvantages of dual and multiple fermentation?

12. (a) Elucidate the basic design of Microbial fermenter.

Or

(b) Mention and explain about the media requirements of Industrial media.

13. (a) How Bioprocess technology can eradicate antimicrobial resistance?

Or

(b) What are the future perspectives of bioprocess technology?

14. (a) What is the cell disruption techniques applied in fermentation technology?

Or

(b) What is the role of chromatography in Bioprocess Technology?

15. (a) How Genetic engineering can be a revolution in production of ample of products through bioprocess?

Or

(b) What is the marketing potential for Bioprocess technology?

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain briefly about downstream and upstream processing?

17. Give a detail account on the problems and requirements of bio-product recovery and purification?

18. What are the effect of maintenance legislation on production of antibiotics and recombinant proteins?

19. Describe the solid-liquid separation in down-stream processing?

20. How can Genetic engineering a pioneer for bio processing in future?

———————

D–1659

Sub. Code
36442

DISTANCE EDUCATION

M.Sc. (Microbiology) DEGREE EXAMINATION, MAY 2023.

Fourth Semester

MICROBIAL BIOTECHNOLOGY

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. Define single cell protein.

2. Define expression vector.

3. What are biofertilizers?

4. What are siderophores?

5. Define biopesticides.

6. What are cytokines?

7. Define bioplastics.

8. Explain the principle of biosensor.

9. What is the role of GUS gene in genetic engineering?

10. Define restriction endonucleases.

SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL the questions, choosing either (a) or (b).

11. (a) Explain the methods used for the mass cultivation of blue green algae.

Or

(b) Discuss the role of Algae in waste water treatment.

12. (a) Explain briefly the role of microbial antagonist in controlling plant pathogens.

Or

(b) Explain the unique features of Vesicular-Arbuscular Mycorrhizae as biofertilizer.

13. (a) Discuss in brief the microbial technology for the production of human growth hormone.

Or

(b) What is Biogas? Explain the role of microbes in the production of biogas.

14. (a) Explain the characteristic features of artificial chromosome vectors.

Or

(b) Explain the working principle of electrochemical biosensor and its applications.

15. (a) Write short notes on genetically modified organism in medicine.

Or

(b) Outline the commercial production of human insulin using GMM.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Elaborate in detail the genetic engineering of microalgae for enhanced biorefinery capabilities.

17. Describe in detail the formulation of microbial herbicides and its application in agriculture.

18. Give a detailed account on microbial production of polysaccharides and add a note on its biotechnological application.

19. Discuss in detail the various techniques used for immobilization of microbial cells.

20. Give a comprehensive overview on ethical issues on genetically modified organisms.

———————

D–1660

Sub. Code
36443

DISTANCE EDUCATION

M.Sc. (Microbiology) DEGREE EXAMINATION, MAY 2023.

Fourth Semester

BIOINFORMATICS AND BIOSTATISTICS

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

Draw diagrams if necessary.

PART A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. What are the major classes of computers?
2. What is a supercomputer?
3. What is WWW? List any two examples?
4. Expand BLAST and FASTA
5. List down any four protein databases.
6. Explain biostatistics.
7. Define phylogenetic alignment.
8. Define protein modelling.
9. Expand ANOVA.
10. Mention any two statistical software.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Give short note on biology in computer age.

Or

(b) How servers and workstations play a role in computers?

12. (a) Differentiate UNIX and LINUX

Or

(b) Write a short note on search engines.

13. (a) Briefly explain the applications of genomics.

Or

(b) How proteomics plays a major role in modern research?

14. (a) Briefly explain the application of biostatistics in modern biology.

Or

(b) What are the measures of central tendencies? Explain in brief.

15. (a) What are the types of probabilities?

Or

(b) What are the types of regression analysis?

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. What are search engines? Explain the different methods of how search engines get information from internet.

17. Differentiate genomics and proteomics in detail.

18. Give a detailed account biological database.

19. Explain protein modelling in detail.

20. Give a detail account on the importance if statistical software in data analysis.

———————