

FACULTY OF SCIENCE

B.Sc. (CBCS) I Semester Examination, December 2023/January 2024

Subject: Microbiology
Paper – I: General Microbiology

Time: 3 Hours

Max. Marks: 80

PART – A

Note: Answer any Eight questions.

(8x4=32 Marks)

1. Contributions of Louis Pasteur
2. Specimen preparation for scanning electron microscopy
3. Capsular staining
4. Eubacteria structure
5. Illustrate TMV structure and label it
6. Enrichment culture technique for bacterial isolations
7. Autotrophic bacteria and their significance
8. Simple media used in the microbiology laboratory
9. Electron transport chain
10. Principle involved in Laminar air flow
11. Batch culture technique
12. Biphasic growth of bacteria

PART – B

Note: Answer all the questions.

(4 x 12 = 48 Marks)

13. (a) Write an account on contributions of Robert Koch and their use in Microbial sciences
(OR)
(b) Explain the principle and types of staining methods used to differentiate bacteria on cell wall structure
14. (a) Write an account on characteristics and classification of viruses
(OR)
(b) Explain isolation of pure culture techniques for bacterial isolation. Add notes on their long term preservation.
15. (a) Describe microbial nutrition and uptake of nutrient phenomena by bacterial cell
(OR)
(b) Write a detail account on TCA cycle of the bacterial metabolism adding note on end products.
16. (a) Write an account on sterilization techniques followed in microbiology lab.
(OR)
(b) Explain the different methods for measurement of microbial growth.

201020457034

Code No. D-6008/BL

FACULTY OF SCIENCE
B.Sc. (CBCS) I Semester (Backlog) Examination, August 2022

Subject: Microbiology
Paper - I : General Microbiology

Time: 3 Hours

Max. Marks: 80

PART - A

Note: Answer any eight questions.

(8 x 4 = 32 Marks)

1. Robert Koch ✓
2. Phase contrast microscope ✓
3. Gram Staining ✓
4. Micromanipulator ✓
5. Lyophilization ✓
6. TMV ✓
7. Glycolysis ✓
8. Mixotrophs ✓
9. Substrate level phosphorylation ✓
10. Turbidometry ✓
11. Synchronous cultures ✓
12. Alcohols and phenols ✓

PART - B

Note: Answer all the questions.

(4 x 12 = 48 Marks)

13. (a) Describe the instrumentation, working and applications of a Fluorescent microscope.

(OR)

(b) Write about the important historical milestones in microbiology and add a note on the importance and applications of the field.

14. (a) Explain the induction of lytic cycle of a lambda bacteriophage.

(OR)

(b) Describe the ultrastructure of bacterial cell and distinguish it from a eukaryotic cell.

15. (a) Give a lucid account of electron transport chain leading to oxidative Phosphorylation.

(OR)

(b) Write about the types of media utilized for cultivation of bacteria.

16. (a) What are the physical methods of sterilization?

(OR)

(b) What are the various factors influencing growth of bacteria? Add a note on bacterial growth curve.

Code No. 6008

FACULTY OF SCIENCE

2021-batch

B.Sc. (CBCS) I Semester Examination, March 2022

Subject: Microbiology

Paper – I: General Microbiology

Time: 3 Hours

Max. Marks: 80

PART – A

Note: Answer any eight questions.

(8 x 4 = 32 Marks)

1. Louis Pasteur ✓

2. Bright field microscope ✓

M 3. Spore Staining ✓

M 4. Micromanipulator ✓

5. Freeze drying ✓

M 6. Enrichment culturing ✓

M 7. Glycolysis ✓

8. Anaplerotic reaction ✓

9. TCA cycle ✓

M 10. Batch cultures ✓

M 11. Moist heat sterilization ✓

12. HEPA filters ✓

PART – B

Note: Answer any four questions.

(4 x 12 = 48 Marks)

13. Describe the instrumentation, working and applications of a Scanning electron microscope.

14. Write about the important milestones in microbiology and add a note on applications of the field.

15. Explain the general characteristics and classification of a virus.

16. Describe the various techniques for isolation of pure cultures.

17. Give a lucid account of ATP synthesis by oxidative phosphorylation.

18. Write about the types of media utilized for cultivation of bacteria.

19. What are the chemical methods of sterilization?

20. List methods for measuring microbial growth.

FACULTY OF SCIENCE
B.Sc. (CBCS) I Semester Examination, February / March 2023
Subject: Microbiology
Paper – I : General Microbiology

Time: 3 Hours

Max. Marks: 80

PART – A**Note: Answer any eight questions.****(8 x 4 = 32 Marks)**

1. Bacterial motility and its significance
2. Method for endospore stain
3. Contributions of Louis Pasteur
4. Lyophilization and its uses
5. Structure of HIV
6. Enrichment culture for bacteria
7. Mixotrophs and nutritional characteristics
8. Fungal preservation methods
9. Electron transport mechanism
10. Radiation methods for sterilization
11. HEPA filters and its use in Laminar air flow
12. Turbidometry for bacterial growth monitoring

PART – B**Note: Answer all the questions.****(4 x 12 = 48 Marks)**

13. (a) Explain the contributions of Robert Koch with past and present research scenario.
(OR)
(b) Describe the principal and application of electron microscopy.
14. (a) Depict the structure and explain the morphology, replication strategy in Lambda phage.
(OR)
(b) According to your research work, what is the need for bacterial pure culture and preservation.
15. (a) How do you think the bacterial cell metabolism contributes to different end products.
(OR)
(b) Explain the difference features of substrate level and oxidative phosphorylation.
16. (a) Explain the different phases of bacterial growth curve based on the factors affecting nutritional phenomena.
(OR)
(b) Compare the synchronous and continuous cultivation of microbial growth.

Code No: E-10108

FACULTY OF SCIENCE

B.Sc. (CBCS) II- Semester (Regular & Backlog) Examination, June/July 2023

**Subject: Microbiology
Paper – II: Microbial Diversity**

Time: 3 Hours

Max. Marks: 80

PART – A

Note: Answer any Eight questions.

(8x4=32 Marks)

- (1) National Biodiversity authority regulations.
- (2) Significance of Whittaker's system of classification.
3. Species abundance in an ecosystem.
- (4) Characteristics of Mycoplasma.
5. Give examples of methanogens.
6. Planctomycetes characteristics.
- (7) Protozoan diversity and its significance.
8. How are Dueteromycetes different from other fungi?
- (9) Economic importance of Cyanophyta.
- (10) What is the great plate count anomaly?
- (11) Give example of perturbed microbial ecosystem.
- (12) What does human microbiome studies explain?

PART – B

Note: Answer all the questions.

(4 x 12 = 48 Marks)

13. (a) Give your explanation about the importance of conservation of microbial diversity.
(OR)
(b) Give the different features of bacterial classification based on Bergey's manual of - systemic bacteriology.
14. (a) What are the characteristics of actinobacteria ? Add note on few important genera and structural features.
(OR)
(b) Explain the structure and physiological features of Archaeobacteria.
15. (a) Write about the fungal biodiversity with suitable examples.
(OR)
(b) Explain about the metabolic characteristics of algae. Add note on the uses of algae.
16. (a) How microbial interactions happen in nature. Give examples of each phenomenon.
(OR)
(b) How the microorganisms can contribute to sustainable agro ecosystems?

FACULTY OF SCIENCE

B.Sc. II - Semester (CBCS) (Regular & Backlog) Examination, June/July 2022

Subject: Microbiology
Paper – II: Microbial Diversity

Time: 3 Hours

Max. Marks: 80

PART – A

Note: Answer any eight questions.

(8 x 4 = 32 Marks)

1. Ecosystem
2. Operational taxonomic units
3. Species abundance
4. Rickettsia
5. Methanogens
6. Bacteroidetes
7. Green algae
8. Plasmodium
9. Reproductive structures in fungi
10. Human Microbiome
11. Culturable methods to study microbial diversity
12. Microbiome preservation

PART – B

Note: Answer all the questions.

(4 x 12 = 48 Marks)

13. (a) Explain about the classification of living organisms.
(OR)
(b) Discuss the analysis of microbial typing based on Bergey's manual of systematic bacteriology.
14. (a) Explain the physiological diversity of Archaeobacteria.
(OR)
(b) Write about the ecology and significance of Acidobacteria.
15. (a) Discuss the algal biodiversity with note on its economic significance.
(OR)
(b) Write notes on (i) Giardia (ii) Club Fungi
16. (a) Explain the reasons for unculturability of microorganisms and strategies employed to understand the same.
(OR)
(b) Write about significance of microbial interactions that aid in mutual relationship.

FACULTY OF SCIENCE
B.Sc. II Semester (CBCS) Examination, October 2021

2810-20-457-013

Subject: Microbiology
Paper – II: Microbial Diversity

Time: 2 Hours

Max. Marks: 80

PART – A

Note: Answer any five questions.

(5 x 4 = 20 Marks)

1. Genetic diversity of bacteria
2. Prokaryotes vs Eukaryotes
3. Whittaker system of classification
4. Mycoplasma
5. Extremophiles
6. Proteobacteria
7. Rhodophyta
8. Zygomycetes ✓
9. Giardiasis
10. Antagonism and competition
11. Plate count anomaly
12. Microbiota vs Microbiome

PART – B

Note: Answer any three questions.

(3 x 20 = 60 Marks)

- 13 Explain the importance of Bergey's manual of classification of bacteria.
- 14 Discuss about the ethical, legal and conservation issues pertaining to microbial diversity.
- 15 Write note on phylum (a) Bacteroidetes (b) Firmicutes.
- 16 Explain about the diversity of Cyanobacteria.
- 17 Explain about fungal classification based on morphological and reproductive features.
- 18 Write about the phylogeny and distribution of Plasmodium species.
- 19 What is metagenomic study? Explain its use to understand microbial communities.
- 20 Explain how environmental perturbations affect the microbial ecosystems.

FACULTY OF SCIENCE
B.Sc. (CBCS) III Semester Examination, December 2023/January 2024

Subject: Microbiology
Paper – III: Food and Environmental Microbiology

Time: 3 Hours

Max. Marks: 80

PART – A

Note: Answer any Eight questions.

(8x4=32 Marks)

1. Fermentation of pickles
2. Fermented food: Idly
3. Microorganisms involved in Kefir fermentation
4. Food preservation methods
5. Enumeration of food spoilage microorganisms
6. FSSAI and its role
7. Water borne pathogens
8. Organic matter degradation
9. Sanitary quality of water
10. Physical properties of soil
11. Plant microbe interaction
12. Rhizosphere microorganisms

PART – B

Note: Answer all the questions.

(4 x 12 = 48 Marks)

13. (a) Write an account on health aspects of fermented foods with examples
(OR)
(b) Write a note on microorganisms in milk and their significance
14. (a) Write a note on mycotoxins and their toxicity in foods
(OR)
(b) Explain the importance and functions of food quality control
15. (a) Write an account on microorganisms in air and their importance
(OR)
(b) Explain water pollution due to degradation of organic matter
16. (a) Write an account on enumeration and activity of microorganisms in soil
(OR)
(b) Explain in detail about the microorganisms involved in nitrogen cycle

Code No: E-10224

FACULTY OF SCIENCE

B.Sc. (CBCS) III - Semester Examination, December 2022 / January 2023

Subject: Microbiology

Paper - III : Food and Environmental Microbiology

Time: 3 Hours

Max. Marks: 80

PART - A

Note: Answer any eight questions.

(8 x 4 = 32 Marks)

1. Cereal based fermented food and beverages
2. Kefir and immunity
3. Classification of prebiotics
4. Issues of food safety
5. Virus contamination in foods
6. Chemicals used in food preservation
7. Microbial aerosols
8. *E. coli* as fecal indicator
9. Waste water bacteria
10. Phyllosphere microbial community
11. Soil microorganisms
12. Carbon sequestration and microorganisms

PART - B

Note: Answer all the questions.

(4 x 12 = 48 Marks)

13. (a) How do you think both prebiotics and probiotics can contribute to human health
(OR)
(b) Write about the different traditional fermented foods with information about the presence of microorganisms and their significance
14. (a) How does the foods gets contaminated with mycotoxins and what are the health hazards associated
(OR)
(b) Write about the culture based and culture independent methods to understand food contamination by microorganisms
15. (a) Write about the microbial degradation of organic contaminants in ground water
(OR)
(b) How would you design the sewage treatment plant and explain what factors are to be considered for sludge treatment
16. (a) How rhizosphere microorganisms and mycorrhizae contribute to plant health
(OR)
(b) Write about the different nitrogen fixing, nitrifying and denitrifying bacteria and their contribution to Nitrogen cycle

FACULTY OF SCIENCE
B.Sc. III Semester (CBCS) Examination, March 2022

Code No. 6324

Subject: Microbiology
Paper – III : Food and Environmental Microbiology

Time: 3 Hours

Max. Marks: 80

PART – A

Note: Answer any eight questions.

Sauerkraut, Kanchi, Pickle (8 x 4 = 32 Marks)

- 1 Indian ethnic fermented vegetables
- 2 Prebiotics for diet
- 3 What do you mean by microorganisms as food?
- 4 Microbial food poisoning
- 5 Quality control management in food industries
- 6 Critical control point identification in food samples.
- 7 How is air responsible for spreading infections?
- 8 Algal growth in water
- 9 Aerobic microorganisms in sewage treatment
- 10 Write about the chemical and physical properties of soil.
- 11 Phyllosphere bacteria and plant health.
- 12 Which bacteria are responsible to balance the nitrogen cycle?

PART – B

Note: Answer any four questions.

(4 x 12 = 48 Marks)

- 13 How do you think microorganisms present in milk affect the quality of dairy products?
- 14 Which of the fermented foods are good probiotic source for human health?
- 15 How does food get contaminated due to mycotoxins? Explain the methods to detect the same.
- 16 What are food borne pathogens? What recommendations can be given to manage safety levels of food quality?
- 17 How do you think water pollution with microorganisms can be eliminated to avoid infectious diseases?
- 18 Write about the significance of anaerobic microorganisms in sewage sludge.
- 19 Write about the plant microbe interactions with suitable examples.
- 20 Explain how microorganisms degrade the organic and inorganic pollutants.

2019 batch

Code No. 18080

FACULTY OF SCIENCE
B.Sc. III Semester (CBCS) Examination, July 2021

Subject: Microbiology
Paper - III : Food and Environmental Microbiology

2810-19-457-

Time: 2 Hours

Max. Marks: 80

PART - A

Note: Answer any five questions.

(5 x 4 = 20 Marks)

- 1 Microbial flora of fresh foods
- 2 Cheese
- 3 Probiotics
- 4 Types of food spoilage organisms
- 5 Quality control +
- 6 Food preservation
- 7 Sanitary examination of water
- 8 Trickling filters X
- 9 Microorganisms in air
- 10 Bioremediation
- 11 Carbon cycle X
- 12 Mycorrhizae

PART - B

Note: Answer any three questions.

(3 x 20 = 60 Marks)

- 13 Define fermentation. Describe the health aspects of fermented foods with two examples.
- 14 Write an essay on fermented milk products and their safety and nutritional value.
- 15 What is food poisoning? Discuss the mycotoxins and bacterial toxins in food and their impact on human health.
- 16 Write a brief account of the methods followed for quality assessment of foods.
- 17 Discuss in detail about various water borne pathogenic microorganisms and their transmission.
- 18 Explain the various processes involved in the treatment of sewage and add a note on the significance of microorganisms.
- 19 Define soil profile and discuss the physical, chemical and biological properties of soil.
- 20 Discuss the role of Microorganisms in nitrogen cycle.

FACULTY OF SCIENCE

B.Sc. (CBCS) IV- Semester (Regular / Backlog) Examination, June / July 2023

Subject: Microbiology

Paper – IV: Medical Microbiology & Immunology

Time: 3 Hours

Max. Marks: 80

PART – A

Note: Answer any eight questions.

(8 x 4 = 32 Marks)

1. Types of bacterial toxins
2. Emerging problem of antimicrobial resistance
3. Examples of nosocomial infections
4. Amoebiasis infection
5. Infection associated with SARS CoV2
6. Structure of Rabies virus
7. Classification of antigens
8. Functions of B lymphocytes
9. Types of Immunoglobulins
10. Auto immune disorders
11. Complement fixation test
12. Types of ELISA

PART – B

Note: Answer all the questions.

(4 x 12 = 48 Marks)

13. (a) Write about the causative agent of tuberculosis and disease symptoms
(OR)
(b) Give an account of the water borne diseases. Add note on diagnostic procedures to detect the pathogens associated
14. (a) Explain the infection associated with plasmodium parasite. Suggest the control measures to overcome the infection.
(OR)
(b) Give explanation of the disease symptoms associated with HIV infection
15. (a) Differentiate the primary and secondary lymphoid organs with functional properties
(OR)
(b) How do you explain the different types of immunity can help to fight diseases
16. (a) Explain the principle involved in antigen antibody reactions. How do you think these assays help in serological diagnostics
(OR)
(b) Write about the monoclonal antibody production and applications

FACULTY OF SCIENCE

B. Sc. (CBCS) IV - Semester (Regular & Backlog) Examination, June / July 2022

Subject: Microbiology
Paper - IV: Medical Microbiology & Immunology

Time: 3 Hours

Max. Marks: 80

PART - A

Note: Answer any eight questions.

(8 x 4 = 32 Marks)

1. Normal flora of the respiratory tract
2. Virulence and attenuation
3. Cholera toxin
4. MERS
5. Hydrophobia
6. *Entamoeba histolytica*
7. B and T lymphocytes
8. Lymph node
9. MHC class II
10. Radioimmuno assay
11. Anaphylaxis
12. Blood group antigens

PART - B

Note: Answer all the questions.

(4 x 12 = 48 Marks)

13. (a) Describe the etiology, pathogenicity, diagnosis and treatment of Typhoid.
(OR)
(b) What is disease caused by *Neisseria gonorrhoeae*? Give an account of its pathogenicity, treatment and epidemiology.
14. (a) Write an essay on polio.
(OR)
(b) What is Hepatitis? Write about the disease caused by Hepatitis B virus.
15. (a) What are antigens? Classify and mention the factors affecting antigenicity.
(OR)
(b) Describe the structure of antibodies and their classification.
16. (a) What are the features of antigen-antibody reactions? Add a note on types of agglutination reactions.
(OR)
(b) What are the major autoimmune diseases?

FACULTY OF SCIENCE

B. Sc. (CBCS) IV - Semester (Regular & Backlog) Examination, June / July 2022

Subject: Microbiology
Paper - IV: Medical Microbiology & Immunology

Time: 3 Hours

Max. Marks: 80

PART - A

Note: Answer any eight questions.

(8 x 4 = 32 Marks)

1. Normal flora of the respiratory tract
2. Virulence and attenuation
3. Cholera toxin
4. MERS
5. Hydrophobia
6. *Entamoeba histolytica*
7. B and T lymphocytes
8. Lymph node
9. MHC class II
10. Radioimmuno assay
11. Anaphylaxis
12. Blood group antigens

PART - B

Note: Answer all the questions.

(4 x 12 = 48 Marks)

13. (a) Describe the etiology, pathogenicity, diagnosis and treatment of Typhoid.
(OR)
(b) What is disease caused by *Neisseria gonorrhoeae*? Give an account of its pathogenicity, treatment and epidemiology.
14. (a) Write an essay on polio.
(OR)
(b) What is Hepatitis? Write about the disease caused by Hepatitis B virus.
15. (a) What are antigens? Classify and mention the factors affecting antigenicity.
(OR)
(b) Describe the structure of antibodies and their classification.
16. (a) What are the features of antigen-antibody reactions? Add a note on types of agglutination reactions.
(OR)
(b) What are the major autoimmune diseases?

FACULTY OF SCIENCE
B.Sc. IV Semester (CBCS) Examination, October 2021

Subject: Microbiology
Paper – IV: Medical Microbiology & Immunology

Time: 2 Hours

Max. Marks: 80

PART – A

Note: Answer any five questions.

(5 x 4 = 20 Marks)

- 1 Normal flora of urogenital tract
- 2 Diagnosis of tuberculosis
- 3 Nosocomial infections
- 4 SARS
- 5 Plasmodium falciparum
- 6 Amoebiasis
- 7 Types of antigens
- 8 Thymus
- 9 MHC class I
- 10 Immunofluorescence
- 11 Anaphylaxis
- 12 Localized autoimmune disorders

PART – B

Note: Answer any three questions.

(3 x 20 = 60 Marks)

- 13 Describe the etiology, pathogenicity, diagnosis and treatment of syphilis.
- 14 What is the disease caused by *Vibrio cholerae*? Give an account of its pathogenicity, treatment and epidemiology.
- 15 Write an essay on Dengue fever.
- 16 What is Rabies? Write about the disease caused by the Rabies virus.
- 17 What are Antibodies? Classify and elucidate their structure.
- 18 Explain about the humoral and cell mediated immune response.
- 19 Elucidate the features of antigen-antibody reactions? Add a note on types of precipitation reactions.
- 20 Describe the classical and alternate pathway of complement activation.

Code No: F-15425/BL

FACULTY OF SCIENCE
B.Sc. (CBCS) V Semester (Backlog) Examination, May/June 2024

Subject : Microbiology
Paper – V (A) : Molecular Biology and Microbial Genetics

Time: 3 Hours

Max. Marks: 80

PART – A

(8x4=32 Marks)

Note: Answer any eight questions.

1. What experiment proves that DNA is a genetic material?
2. Illustrate structure of DNA and label it clearly.
3. What is Mendelian concept of heredity?
4. Explain DNA damage and SOS repair.
5. What are the physical agents responsible for mutation?
6. How gene transfer occur in bacteria through transduction?
7. Explain one gene – one enzyme concept.
8. Mention the functions of RNA.
9. Who discovered genetic code and what are its features?
10. Types of endonucleases.
11. Construction of cDNA library.
12. How plasmids can be used as vectors?

PART – B

Note: Answer all the questions.

(4x12=48 Marks)

13. (a) How recombination process is used to understand the distance between the genes.
(OR)
(b) Give explanation about extra chromosomal genetic elements.
14. (a) Write about the significance of bacterial transformation.
(OR)
(b) Describe the chemical mutagenic agents with suitable examples.
15. (a) Give overview of transcription in prokaryotes.
(OR)
(b) What is operon concept in molecular biology? Explain the Lac operon.
16. (a) Write about the different enzymes involved in gene cloning.
(OR)
(b) How genetic engineering studies can be used in industry and medical applications?

FACULTY OF SCIENCE

B.Sc. (CBCS) V- Semester Examination, December 2022 - January 2023

Subject: Microbiology

Paper – V (A): Molecular Biology & Microbial Genetics

Time: 3 Hours

Max. Marks: 80

PART – A

Note: Answer any eight questions.

(8 x 4 = 32 Marks)

1. Extra chromosomal genetic elements
2. Crossing over vs linkage
3. RNA as genetic material
4. Frame shift mutations
5. DNA proofreading
6. Bacterial conjugation
7. Benzer's experiment and cistron
8. Genetic code
9. Constitutive genes
10. Restriction endonucleases
11. Taq polymerase and PCR
12. Viral vectors

PART – B

Note: Answer all the questions.

(4 x 12 = 48 Marks)

13. (a) Write about the Watson and Crick structure of DNA with proper illustration
(OR)
(b) Write about the semi conservative mode of DNA replication with enzymes involved in the complete process.
14. (a) Discuss on the DNA damage due to mutagenic agents and explain the DNA repair mechanisms.
(OR)
(b) Describe the bacterial recombination and Transduction mechanism.
15. (a) Explain the RNA transcription in prokaryotes.
(OR)
(b) Explain the Lac operon concept in *E. coli*.
16. (a) How can you generate genomic library and cDNA library. Add notes on their applications.
(OR)
(b) Give the methods involved in recombinant technology and its use in fermentation industry.

Subject : Microbiology
Paper – V (B) : Microbial Omics

Time: 3 Hours

PART – A

Max. Marks: 80

(8x4=32 Marks)

Note: Answer any eight questions.

1. Transcriptomic analysis and uses.
2. Depict the structure of DNA and explain its functions.
3. Why Metagenomics is break through technology?
4. Explain NMR technique and its limitation.
5. Give the 3D structure of protein.
6. What are the proteins present in prions?
7. Studies of transposon mutagenesis
8. Applications of Microbial genomic studies
9. What is Gene silencing and RNA i?
10. What is UNIPROT used for in bioinformatics?
11. Give the methodology of whole genome sequence.
12. How to construct phylogenetic tree of closely related bacterial species?

PART – B

Note: Answer all the questions.

(4x12=48 Marks)

13. (a) What are the emerging studies based on NGS? Give a suitable example based on disease diagnosis.
(OR)
(b) Give your supportive explanation of the need for metabolomics data along with metagenomics.
14. (a) How NMR and homology modeling studies are used to understand protein structure
(OR)
(b) Explain the principle involved in protein engineering? Add note on the therapeutic applications
15. (a) How studies on functional genomics add to vaccine research
(OR)
(b) How CRISPR-Cas9 studies emerged as genome editing tools? Support your explanation with suitable example
16. (a) Compare the different databases used in microbial sciences
(OR)
(b) Explain the concept "Bioinformatics is an inter-disciplinary field of science to understand biological data".

Subject : Microbiology

Paper – IV (DSC)
Microbial Genetics and Molecular Biology

Time : 2 Hours

Max. Marks: 80

PART – A

Note: Answer any four questions.

(4 x 5 = 20 Marks)

- 1 Crossing over and its importance
- 2 Differences between DNA and RNA
- 3 Mutagens
- 4 F^+ , F^- , HFr
- 5 One gene – one enzyme hypothesis
- 6 Genetic code
- 7 Gene cloning
- 8 Vectors

PART – B

Note: Answer any four questions.

(4 x 15 = 60 Marks)

- 9 Give an account of Watson and Crick model of DNA.
- 10 Explain in detail, how DNA replication occurs with the aid of DNA polymerase, RNA polymerase primase and ligase. Are the new strands identical to the original strand.
- 11 Describe the types of mutations and its causes in detail.
- 12 Describe the gene transfer process in bacteria stating the means of transferring genetic material the source of the transferred genetic material and the condition of the donor and recipient cells before, during and after each process.
- 13 Define protein synthesis. Explain the roles of chromosomal DNA, m RNA, f RNA and rRNA in the process as well as how complementary base pairing is involved.
- 14 Describe the constitutive and regulated gene expression with the cell.
- 15 Outline gene cloning methods.
- 16 Describe how humans are benefitted from rDNA technology.

FACULTY OF SCIENCE

B.Sc. (CBCS) VI - Semester (Regular / Backlog) Examination, June / July 2023

Subject: Microbiology

Paper- VI (A): Industrial Microbiology

Time: 3 Hours

Max. Marks: 80

PART – A

Note: Answer any eight questions.

(8 x 4 = 32 Marks)

1. Adsorption and immobilization of microbial cells
2. Antimicrobial compounds of actinobacteria
3. Seed inoculum
4. Fermenter types
5. Probes for temperature and pH control in fermenter
6. Physio-chemical standards in bioreactor
7. Dual fermentation
8. Bacterial fermentations
9. Growth kinetics of bacteria in fermenter
10. Amylase production
11. Biogas -
12. Toxic and hazardous waste treatment

PART – B

Note: Answer all the questions.

(4 x 12 = 48 Marks)

13. (a) Write about the strain improvement strategies used to enhance the microbial product yield
(OR)
(b) Explain the methods used to screen bacteria for industrially important enzymes
14. (a) Depict the fermenter figure and add notes on the use and limitations of bioreactor
(OR)
(b) Write about the downstream processing to purify and quantify the microbial products
15. (a) If you wish to enhance the production of antibiotic, which of the fermentation process would you recommend at the industrial level
(OR)
(b) Write about the upstream and downstream process of alcohol production
16. (a) Explain about the raw materials used in production of
i. Citric acid ii. Glutamic acid
(OR)
(b) Describe the importance of recombinant technology for production of viral vaccines

FACULTY OF SCIENCE

B.Sc. (CBCS) VI- Semester (Regular / Backlog) Examination, June / July 2023

Subject: Microbiology

Paper – VI (B) : Pharmaceutical Microbiology

Time: 3 Hours

Max. Marks: 80

PART – A

Note: Answer any eight questions.

(8 x 4 = 32 Marks)

1. Contributions of Paul Ehrlich
2. Synthetic drugs and antibiotics
3. Metranidazole group of drugs
4. Multi drug therapy
5. Non medical uses of antibiotics
6. Types of antibiotics
7. Mode of action of nystatin
8. Which antibiotic does *Streptomyces griseus* produce?
9. Genetics of drug resistance
10. Characterization of nutritional mutants
11. How to determine MIC of a drug
12. Bacteriocidal vs Bacteriostatic agents

PART – B

Note: Answer all the questions.

(4 x 12 = 48 Marks)

13. (a) Explain about the use of plants and arsenicals as chemotherapeutic agents
(OR)
(b) Write about the different antitubercular compounds and dosage recommendations.
14. (a) Explain about lab and clinical diagnosis, based on which drugs will be recommended.
(OR)
(b) Write about the drug dosage and choice of drug
15. (a) What are beta lactam antibiotics? Briefly explain the mechanism of action
(OR)
(b) Explain the mode of action of membrane inhibitor drugs and their effectiveness
16. (a) Write about the different qualitative assays to determine antibiotic sensitivity
(OR)
(b) Why studies on drug sensitivity are recommended during disease diagnosis. Take UTI and give your explanation

FACULTY OF SCIENCE
B. Sc. (CBCS) VI - Semester (Regular) Examination, June / July 2022

Code No: D-6623

Subject: MICROBIOLOGY
Paper - VI (A): Industrial Microbiology

Time: 3 Hours

Max. Marks: 80

PART - A

Note: Answer any eight questions.

(8 x 4 = 32 Marks)

1. Industrial importance of Fungi
2. Seed culture
3. Actinomycetes
4. Inoculum medium
5. Anti-foam agents in fermentation process
6. Shaft in fermenter
7. Batch fermentation
8. Surface fermentation
9. Submerged fermentation
10. Recombinant vaccine
11. Amylase
12. Glutamic acid

PART - B

Note: Answer all the questions.

(4 x 12 = 48 Marks)

13. a) Explain various strain improvement methods.
(OR)
b) Describe various immobilization techniques.
14. a) Describe the structure of typical bioreactor.
(OR)
b) Explain about various raw materials used in fermentation
15. a) Describe solid state and submerged fermentation with suitable examples.
(OR)
b) Write on microbial production of Lactic acid.
16. a) Write on fermentation process for the production of Beer.
(OR)
b) Describe the medium, fermentation process and recovery of Penicillin.

(7)

Code No: D-6649

FACULTY OF SCIENCE
B.Sc. (CBCS) VI - Semester (Regular) Examination, June - August 2022

Subject: MICROBIOLOGY
Paper - OPTIONAL: Applied Microbiology

Time: 3 Hours

Max. Marks: 60

PART - A

Note: Answer any five questions.

(5 x 3 = 15 Marks)

1. MTCC
2. IPR
3. Bacterial carotenoids
4. Aroma producing microbes
5. Blood smear staining for malaria
6. Collection of sample for lower respiratory infection
7. *Bacillus thuringiensis*
8. Metabolic engineering

PART - B

Note: Answer all the questions.

(3 x 15 = 45 Marks)

9. a) Write about nitrogen fixing and phosphate solubilising microorganisms.
(OR)
b) Explain mass production and application of *Pseudomonas* in agriculture.
10. a) Explain about production of microbial pigments.
(OR)
b) Explain production of Coumarin and its applications.
11. a) Explain on different staining methods used in diagnostic microbiology.
(OR)
b) Explain various serological techniques used for diagnosis of bacterial diseases.

**