

- vi. In which type of chromatography, the stationary phase is held in a narrow tube and the mobile phase is forced through it under pressure ?
- A) Column chromatography B) Paper chromatography
C) Thin Layer D) All of these
- vii. Which of the following are the recommended heat temperature and time periods for the moist heat sterilization method used in an autoclave ?
- A) 180⁰ C for 5 minutes B) 121⁰ C for 15 minutes
C) 100⁰ C for 3 minutes D) 160⁰ C for 45 minutes
- viii. All of the following chemical disinfectants used in laboratories and healthcare industries have been found to be effective against many bacteria, fungi, and viruses, except ?
- A) Alcohols B) Ethylene oxide
C) Formaldehyde D) DMSO
- ix. Centrifugation is based on which of the following law ?
- A) Pascal's laws B) Stokes law
C) Stain law D) Patrick's law
- x. Which of the following bacteria was not discovered by Robert Koch ?
- A) *Bacillus anthracis* B) *Mycobacterium tuberculosis*
C) *Salmonella typhi* D) *Vibrio cholerae*

SECTION - B

Answer/Write notes on any FIVE of the following. :

5X 3= 15 Marks

2. Contribution of Louis Pasteur
3. Tyndallization
4. Enriched media
5. Antibiotic resistance
6. Cryopreservation
7. Acid fast staining technique
8. Resolving power of microscope
9. Amphotericin B

Contd...3

SECTION - C

Medium Answer questions.

Answer any THREE questions from the following.

3X 5= 15 Marks

10. Write the steps involved in gram's staining technique.
11. List the parts of the transmission electron microscope and describe their functions.
12. Define growth. Explain the phases of the growth curve.
13. Write the principle and applications of Spectrophotometer
14. Explain antibiotic sensitivity testing methods

SECTION - D

Answer the following:

2X 10= 20 Marks

15. a) Describe the methods of heat sterilization.

OR

- b) Write a detailed account on pure culture techniques.

16. a) Explain the modes of action of antibiotics.

OR

- b) Discuss the scope and applications of Microbiology.

Fourth Semester B.Sc., Degree Examinations

September / October 2022

(Semester Scheme) 2017 Admission batch onwards

BIOTECHNOLOGY

SSD250 : Paper 4.1 : Genetic Engineering, Bioethics and Biosafety

Time: 3 hrs.]

[Max.Marks:50

Instructions to the Candidates :

1. Part I should be answered in the first two pages of the main answer book.
2. Draw labeled diagrams wherever necessary.
3. All questions are compulsory.

PART – I

I. Simple answer questions :

1X5= 5 Marks

Answer in a word, or a phrase or a sentence.

1. What are GMOs?
2. Expand YAC and BAC.
3. Who discovered PCR technique ?
4. What is patent?
5. Define pyrosequencing.

PART – II

II. Short answer questions. Answer any THREE of the following.

3 X 3= 9 Marks

6. Write the structure of pBR322.
7. What is chromosome walking? Explain.
8. Explain yeast as recombinant host.
9. Explain microarray technique.
10. Write a note on superbug.

Contd...2

PART – III

III. Medium answer questions. Answer any FOUR of the following. 4X5= 20 Marks

11. Discuss the principle and applications of DNA finger printing technique.
12. Give an account of GMP.
13. Explain the construction of cDNA library
14. Write the significance of *Agrobacterium* as a vector.
15. Explain the electroporation technique.
16. Give an account of provisions and legal protection in IPR. .

PART – IV

IV. Long answer questions : 2X8=16 Marks

Answer any TWO of the following.

17. Explain Sanger's method of DNA sequencing.
18. Describe the methods of screening of recombinants.
19. Write a note on:
 - a. Cosmids
 - b. PCR Cycle

Fifth Semester B.Sc., Degree Examinations

April / May 2022

(Semester Scheme)

(2017 Admission Batch onwards)

BIOTECHNOLOGY

SSE 250: Paper 5 : Microbial Biotechnology and Bioprocess Engineering

Time: 3 hrs.]

[Max.Marks:50

Instructions to the Candidates :

1. *Part I should be answered in the first two pages of the main answer book.*
2. *Draw labeled diagrams wherever necessary.*
3. *All questions are compulsory.*

PART - I

I. Simple answer questions :

5 X 1= 5 Marks

Answer in a word or a phrase or a sentence.

1. Write any two uses of formaldehyde.
2. Define inoculation.
3. Name the causative agent of wheat rust.
4. What is bioaugmentation ?
5. What are baffles ?

PART - II

II. Short answer questions.

3 X 3= 9 Marks

Answer any THREE of the following.

6. What are the contributions of Louis Pasteur ?
7. Explain the preparation of PDA.
8. Explain dialysis.
9. How the alkanes are degraded.
10. List the mode of temperature regulation in a bioreactor.

PART - III

III. Medium answer questions.

4X5= 20 Marks

Answer any FOUR of the following.

11. Explain fitter sterilization.

Contd...2

12. Write a note on pure culture techniques.
13. Explain Botulism.
14. Discuss bioleaching of copper.
15. Write an account on substrates involved in fermentation.
16. Explain the industrial production of acetic acid.

PART – IV

IV. Long answer questions :

2X8=16 Marks

Answer any TWO of the following.

17. Explain the growth curve and enumeration of micro organisms in detail
18. Write a note on applications of environmental microbiology.
19. Write short note on the following
 - a) TEM
 - b) Candidiasis

Contd...3

Fifth Semester B.Sc., Degree Examinations

April / May 2022

(Semester Scheme)

(2011-12 Admission Batch onwards)

BIOTECHNOLOGY

SSE 250: Paper 5.1 : Genetic Engineering

Time: 3 hrs.]

[Max.Marks:50

Instructions to the Candidates :

1. Part I should be answered in the first two pages of the main answer book.
2. Draw labeled diagrams wherever necessary.
3. All questions are compulsory.

PART - I

I. Simple answer questions :

5 X 1= 5 Marks

Answer in a word, or a phrase or a sentence.

1. Define copy number.
2. What is reverse transcription?
3. Name the enzyme used in PCR.
4. Name any two examples of plasmid vectors.
5. Define IPR.

PART - II

II. Short answer questions.

3 X 3= 9 Marks

Answer any THREE of the following.

6. Write a note on PBR 322
7. Write a note on Legation.
8. What are the requirements of a patent?
9. Comment on microinjection.
10. List out the application of DNA finger printing technique.

PART - III

III. Medium answer questions.

4X5= 20 Marks

Answer any FOUR of the following.

11. Write the procedure involved in isolation DNA from animal source.

Contd...4

12. Explain the procedure of introduction of a gene into host cell by Transfection.
13. Write a note on detection of rDNA by colony hybridization technique.
14. Schemate the restriction mapping technique.
15. With neat diagram illustrate the western blotting technique.
16. Write a note on Dolly.

PART – IV

IV. Long answer questions :

2X8=16 Marks

Answer any TWO of the following.

17. Explain in detail Chromosome walking technique.
18. Write the procedure of obtaining Patent.
19. Explain PCR cycle.

Fifth Semester B.Sc., Degree Examinations

April / May 2022

(Semester Scheme)

(2017-18 Admission Batch onwards)

BIOTECHNOLOGY

SSE 251: Paper 5: Immunology and Medical Biotechnology

Time: 3 hrs.]

[Max.Marks:50

Instructions to the Candidates :

1. Part I should be answered in the first two pages of the main answer book.
2. Draw labeled diagrams wherever necessary.
3. All questions are compulsory.

PART - I

I. Simple answer questions :

5 X 1= 5 Marks

Answer in a word, or a phrase or a sentence.

1. What is convalescent sera ?
2. Name two Adjuvants.
3. Define Immunoglobulins.
4. What are edible Vaccines ?
5. What is Somatostatin?

PART - II

II. Short answer questions.

3 X 3= 9 Marks

Answer any THREE of the following.

6. Explain the mechanism of agglutination.
7. Write a note on 'Grave's Disease'.
8. List any three enzymes in therapy.
9. Differentiate Somatic cell gene therapy and germline gene therapy.
10. What are Interferons ? Explain.

PART - III

III. Medium answer questions.

4X5= 20 Marks

Answer any FOUR of the following.

11. What are Primary Immune Organ ? Explain the Structure and function of Thymus.

Contd...2

12. Explain IgM.
13. What is RIA ? Explain the principle and applications.
14. Explain enzymes used in diagnosis.
15. Explain Ex-Vivo gene therapy with example.
16. What are conventional vaccines ? Explain OPV.

PART – IV

IV. *Long answer questions :*

2X8=16 Marks

Answer any TWO of the following.

17. Explain Human Genome Project and its implications.
18. What is complement fixation ? Explain Alternative and classical pathway.
19. Write a short note on
 - a) Explain Anaphylaxis
 - b) Human Factor - IX

Contd...3

Fifth Semester B.Sc., Degree Examinations

April / May 2022

(Semester Scheme)

(2011 Batch onwards)

BIOTECHNOLOGY

SSE 251: Paper VI : Immunology

Time: 3 hrs.]

[Max.Marks:50

Instructions to the Candidates :

1. Part I should be answered in the first two pages of the main answer book.
2. Draw labeled diagrams wherever necessary.
3. All questions are compulsory.

PART - I

I. Simple answer questions :

Answer in a word, or a phrase or a sentence.

5 X 1= 5 Marks

1. What is humoral immunity?
2. Define Antigen.
3. What are vaccines?
4. What is opsonization?
5. Name two antigen presenting cells.

PART - II

II. Short answer questions.

Answer any THREE of the following.

3 X 3= 9 Marks

6. What are Adjuvants? Explain.
7. Differentiate active immunity from passive immunity.
8. Explain Neutrophils.
9. What is agglutination? Explain.
10. Discuss the scope of Immunology.

PART - III

III. Medium answer questions.

Answer any FOUR of the following.

4X5= 20 Marks

11. Explain the structure and function of Thymus.

Contd...4

12. Write the theories of Antibody Generation.
13. Write principle, protocol and application of RIA.
14. Explain the phases of Immune Response.
15. What are autoimmune diseases? Explain.
16. Explain the properties and function of 'IgA'.

PART - IV

IV. Long answer questions :

2X8=16 Marks

Answer any TWO of the following.

17. What is complement system? Explain pathways.
18. Explain Hypersensitivity and its types with example.
19. Write notes on :
 - a) Attenuated Vaccines
 - b) Haemolytic anemia

Fifth Semester B.Sc., Degree Examinations

September / October 2022

(Semester Scheme)

(2017-18 Admission Batch onwards)

BIOTECHNOLOGY

SSE 251: Paper 5.2 : Immunology and Medical Biotechnology

Time: 3 hrs.]

[Max.Marks:50

Instructions to the Candidates :

1. Part I should be answered in the first two pages of the main answer book.
2. Draw labeled diagrams wherever necessary.
3. All questions are compulsory.

PART – I

I. Simple answer questions :

Answer in a word or a phrase or a sentence.

5 X 1= 5 Marks

1. Name any two Antigen Presenting Cells?
2. What are Haptens ?
3. Name any two autoimmune diseases.
4. Expand CFTR.
5. Give two example for polio vaccines?

PART – II

II. Short answer questions.

Answer any THREE of the following.

3 X 3= 9 Marks

6. List the contributions of Louis Pasteur
7. Diagrammatically represent and explain clonal expansion theory.
8. Write the principle of Immunfluorescence.
9. How creatinine kinase can be used as diagnostic tool
10. What are toxoids? Explain.

Contd...2

PART - III

III. *Medium answer questions.*

Answer any FOUR of the following.

4X5= 20 Marks

11. Explain the theories of antibody generation.
12. What is complement fixation? Explain classical pathway.
13. Write a neat diagram of Lymphnodes and explain its function.
14. Outline the production of recombinant hepatitis B vaccine production.
15. Explain the therapeutic application of enzymes
16. What is Hemophilia? How it can be treated with rDNA technology.

PART - IV

IV. *Long answer questions :*

2X8=16 Marks

Answer any TWO of the following.

17. Give an account of immunological role of T cells
18. Explain the different strategies used in gene therapy.
19. Write a short note on:
 - a) Human genome project.
 - b) MHC

Fifth Semester B.Sc., Degree Examinations

September / October 2022

(Semester Scheme)

(2017-18 Admisston Batch onwards)

BIOTECHNOLOGY

SSE 250: Paper 5.1 : Microbial Biotechnology and Bioprocess Engineering

Time: 3 hrs.]

[Max.Marks:50

Instructions to the Candidates :

1. Part I should be answered in the first two pages of the main answer book.
2. Draw labeled diagrams wherever necessary.
3. All questions are compulsory.

PART – I

I. Simple answer questions :

Answer in a word or a phrase or a sentence.

5 X 1= 5 Marks

1. What are the uses of agar – agar ?
2. What are chemoautotroph's?
3. Define and fast staining.
4. What is sparger ?
5. Expand SEM and TEM.

PART – II

II. Short answer questions.

Answer any **THREE** of the following.

3 X 3= 9 Marks

6. Write the contributions of Robert Koch.
7. Explain food poisoning.
8. Explain activated sludge.
9. How the alkenes are degraded ?
10. List the uses of antifoam agents.

PART – III

III. Medium answer questions.

Answer any **FOUR** of the following.

4X5= 20 Marks

11. Explain chemical sterilizers.

Contd...2

12. Classify the culture media.
13. Explain rust of wheat.
14. Write a note on bioleaching with an example.
15. Write a detailed account on anaerobic fermentation.
16. Explain Industrial Production of Amylase.

PART – IV

IV. Long answer questions :

2X8=16 Marks

Answer any TWO of the following.

17. Give the nutritional classification of bacteria.
18. Discuss waste water treatment in detail.
19. Write short note on the following
 - a) Fluorescent Microscope
 - b) Primary screening methods

Fifth Semester B.Sc., Degree Examinations

September / October 2022

(Semester Scheme)

(2017-18 Admisston Batch onwards)

BIOTECHNOLOGY

SSE 250: Paper 5.1 : Microbial Biotechnology and Bioprocess Engineering

Time: 3 hrs.]

[Max.Marks:50

Instructions to the Candidates :

1. Part I should be answered in the first two pages of the main answer book.
2. Draw labeled diagrams wherever necessary.
3. All questions are compulsory.

PART – I

I. Simple answer questions :

5 X 1= 5 Marks

Answer in a word or a phrase or a sentence.

1. What are the uses of agar – agar ?
2. What are chemoautotroph's?
3. Define and fast staining.
4. What is sparger ?
5. Expand SEM and TEM.

PART – II

II. Short answer questions.

3 X 3= 9 Marks

Answer any **THREE** of the following.

6. Write the contributions of Robert Koch.
7. Explain food poisoning.
8. Explain activated sludge.
9. How the alkenes are degraded ?
10. List the uses of antifoam agents.

PART – III

III. Medium answer questions.

4X5= 20 Marks

Answer any **FOUR** of the following.

11. Explain chemical sterilizers.

Contd...2

12. Classify the culture media.
13. Explain rust of wheat.
14. Write a note on bioleaching with an example.
15. Write a detailed account on anaerobic fermentation.
16. Explain Industrial Production of Amylase.

PART – IV

IV. Long answer questions :

2X8=16 Marks

Answer any TWO of the following.

17. Give the nutritional classification of bacteria.
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19. Write short note on the following
 - a) Fluorescent Microscope
 - b) Primary screening methods
