

Roll No. _____

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (Honours) (Microbiology) (Sem-2)

BACTERIOLOGY

Subject Code : BSMB201-19

M.Code : 79872

Date of Examination : 09-05-2026

Time : 3 Hrs.

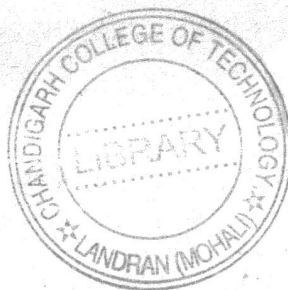
Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

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1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
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 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION - A

- Define capsule and its significance.
- What are fimbriae?
- What is Gram staining principle?
- Define L-forms.
- What is selective media?
- Define specific growth rate.
- What is filtration?
- Name two genera of Crenarchaeota.
- What is nucleoid?
- Define desiccation.



May - 2026

SECTION-B

2. Compare Gram-positive and Gram-negative cell walls.
3. Explain streak plate method.
4. Discuss chemical methods of microbial control.
5. Describe SEM and TEM microscopy.
6. Explain nutritional requirements of bacteria.

SECTION-C

7. Describe bacterial cell membrane structure and functions.
8. Explain phases of bacterial growth curve and their significance.
9. Discuss morphology, metabolism and economic importance of Gram-positive and Gram-negative bacteria.

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

Bachelor of Science - Honours (Microbiology) (Sem.-2)

FUNDAMENTALS OF BIOCHEMISTRY

Subject Code : BSMB203-19

M.Code : 79874

Date of Examination: 12-05-2026

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

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SECTION-A

1. Write briefly :

- (a) Define ionization with one example
- (b) Define carbohydrate and its main use
- (c) Write one example of disaccharides with use
- (d) Write the difference between Ganglioside and Lipopolysaccharides
- (e) Define Plant steroids
- (f) Write any two names of amino acids with application in microbiology
- (g) Clarify the role of UV absorption in Biochemistry
- (h) Write the sources of Nicotinamide
- (i) Write the full form of TPP with main use
- (j) Define Biotin



may - 2026

SECTION - B

2. Discuss the carbohydrates as informational molecules with suitable examples
3. Write short note on cell Signals and prostaglandins with application
4. Discuss the structure and functions of naturally occurring glutathione and insulin
5. Write a short note on glycoproteins
6. Define and classify the vitamins with suitable examples

SECTION - C

7. Explain in detail about DNA and RNA along with applications
8. Explain the functions and properties of Proteins with classifications
9. Discuss about chemical foundations of Life

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Total No. of Questions : 09

MOLECULAR BIOLOGY

Subject Code : BSMB 205-19

M.Code : 79876

Date of Examination : 15-05-2026

Time : 3 Hrs.

Max. Marks : 60

SECTION-B

2. Explain the historical development of DNA structure from Miescher to Watson and Crick.
3. Describe types of DNA and their structural differences.
4. Explain the mechanism of DNA replication in prokaryotes.
5. Describe transcription in prokaryotes.
6. Explain the process of translation in prokaryotes.

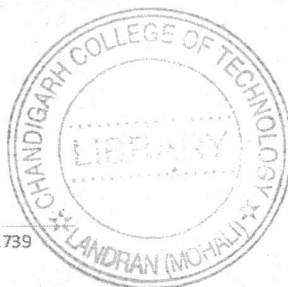
SECTION-C

7. Describe DNA organization in prokaryotes, viruses, and eukaryotes.
8. Explain different models of DNA replication (theta, rolling circle, D-loop).
9. Discuss regulation of gene expression in prokaryotes with lac operon as example.

SECTION - A

1. Write briefly :

- Define genetic material.
- State any two salient features of DNA double helix.
- What are Cot curves?
- Differentiate between DNA and RNA (any two points).
- Define DNA denaturation.
- What is semi-conservative replication?
- Name any two enzymes involved in DNA replication.
- Define promoter.
- What is RNA interference?
- Define operon.



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May - 2026

may - 2026

Roll No.

Total No. of Pages : 02

Total No. of Questions: 09

B.Sc- Honours (Microbiology) (Sem.-3)

MICROBIOLOGICAL ANALYSIS IN AIR AND WATER

Subject Code: BSMB307-19

M.Code:90373

Date of Examination:12-06-2026

Time: 3 Hrs.

Max. Marks:30

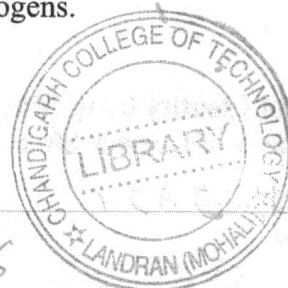
INSTRUCTIONS TO CANDIDATES:

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SECTION-A

1. Answer briefly:

- (a) What are indicator microorganisms
- (b) Which bacilli have ability to ferment lactose?
- (c) What is Tryptone Water Test?
- (d) Define aero microbiology.
- (e) Write names of two culture medias for bacteria.
- (f) Define 'bioerosols'.
- (g) What are indoor air microbes?
- (h) What do you mean by droplet nuclei?
- (i) Define faecal coliforms.
- (j) Name any three water borne pathogens.



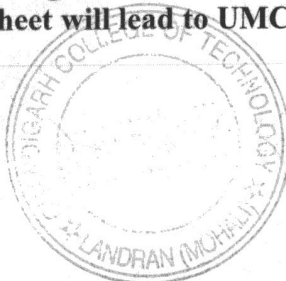
SECTION-B

2. Write three significance of microbes in food
3. Write a note on culture media for fungi.
4. Classify water borne pathogens.
5. Write about presumptive test.
6. Write advantages of membrane filtration method

SECTION-C

7. Three common sampling techniques used to separate and collect the bioaerosols and explain Impingement
8. Write note on Electrostatic Precipitation.
9. Discuss in brief about presence/absence tests.

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Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

Bachelor of Science - Honours (Microbiology) (Sem.-3)

BIOSTATISTICS

Subject Code BSMB 308-19

M.Code: 90374

Date of Examination: 10-06-2026

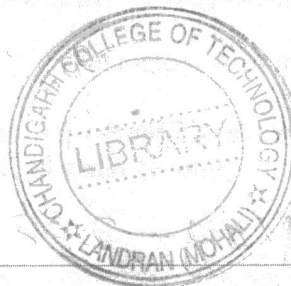
Time: 3 Hrs.**Max. Marks: 60**

INSTRUCTIONS TO CANDIDATES:

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SECTION - A

1. **Write briefly:**
- (a) Define Mean
 - (b) Define Type I error
 - (c) Define Range with example
 - (d) Define Degrees of Freedom
 - (e) Write any one law of probability
 - (f) Define Null hypothesis
 - (g) What is the probability to get three when dice is thrown once
 - (h) Define Covariance
 - (i) Define kurtosis
 - (j) Draw the positive correlation graph



SECTION - B

2. Calculate mode for given data

Class interval	0-5	5-10	10-15	15-20	20-25
frequency	2	5	9	3	5

3. A coin is tossed six times. What is the probability of obtaining four or more heads?
4. Give the salient features of Correlation.
5. Write a note on dependent t-Test.
6. in an anti malarial campaign particular city, quinine was given to some people Discuss the Usefulness of quinine checking malaria by using chi square test

Observed: 20 220 792 2216

Expected: 60 180 752 2256 (Table value is 3.84)

SECTION - C

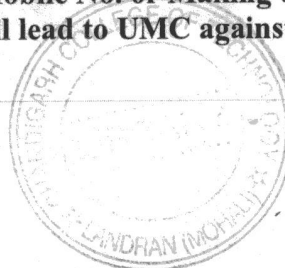
7. Discuss in brief about (a) Poisson distribution (b) Shanon weaver index
8. Perform one way Analysis of variance for the given following data $F_{0.05}(2,6)$ is 5.14.

A	B	C
5	4	3
6	5	7
7	3	5

9. Discuss about
- (a) Normal distribution and its significance
- (b) Important of wilcoxon test

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May-2026



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Total No. of Pages: 02

Total No. of Questions: 09

B.Sc. Honours (Microbiology) (Sem.-3)

VIROLOGY

Subject Code : BSMB301-19

M.Code: 90367

Date of Examination: 08-06-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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SECTION A

1. Answer the following questions:

- (a) Define virus.
- (b) What is capsid symmetry.
- (c) Define enveloped virus.
- (d) What is viral cultivation.
- (e) Define bacteriophage.
- (f) What is lysogenic cycle.
- (g) Name any two animal viruses.
- (h) What is retrovirus.
- (i) Define pathogenesis.
- (j) What is interferon.



May -2026

SECTION B

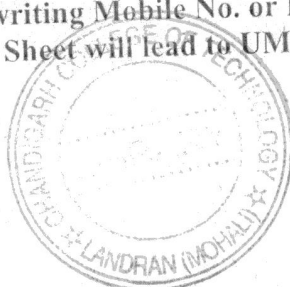
2. Explain the structure of viruses with suitable diagram.
3. Describe the life cycle of T4 bacteriophage.
4. Explain the replication strategy of influenza virus.
5. Write a note on plant viruses with suitable examples.
6. Explain antiviral drugs and their mode of action.

SECTION C

7. Explain the classification and taxonomy of viruses along with methods of isolation and purification.
8. Discuss in detail the lytic and lysogenic cycles in bacteriophages and their regulation mechanisms.
9. Explain viral pathogenesis, stages of infection, and principles of vaccination in viral diseases.

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May - 2026



Roll No.

Total No. of Pages : 02

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B.Sc. Hons. (Microbiology) (Sem.-4)

ANALYTICAL TECHNIQUES IN MICROBIOLOGY

Subject Code : BSMB407-20

M.Code : 92105

Date of Examination : 12-05-2026

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
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3. SECTION-C contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

SECTION - A

1. Write briefly :
 - a) Principle of centrifugation.
 - b) What is Ion exchange chromatography?
 - c) Discuss gel chromatography.
 - d) Describe the concept of x-ray diffraction.
 - e) Explain the principle of NMR spectroscopy.
 - f) What is Beer-Lambert law?
 - g) Define clinical microbiology.
 - h) Enlist the factors affecting the absorption properties of the chromophore.
 - i) Write the chemical shift.
 - j) What is GLC?



may - 2026

SECTION-B

2. Discuss the concept of paper chromatography.
3. Write about mass spectroscopy.
4. Describe different types of 2D, 3D electrophoresis.
5. Write a detailed account of Raman spectra of the simple molecule effect.
6. Write a note on hyperfine splitting and relaxation process in NMR spectroscopy.

SECTION-C

7. Detailed about absorption spectroscopy and Beer-Lambert law.
8. Describe in depth the Quantum mechanical reason of Raman effect.
9. Explanation of concept of pure rotational and vibrational spectroscopy.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. Honours (Microbiology) (Sem.-4)

PHYCOLOGY AND MYCOLOGY

Subject Code : BSMB401-20

M.Code : 92099

Date of Examination : 18-05-2026

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
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SECTION-A

1. Write briefly :

- a) Define mycology.
- b) Name any two genera of Diatoms.
- c) What are the different forms of thallus organization in algae?
- d) Write the main characteristic of Myxomycetes.
- e) State one pathogenic fungus.
- f) Mention two uses of lichens.
- g) What is the role of Polyphysiphonia in the ecosystem?
- h) Name a systemic fungal infection.
- i) What is the occurrence of Saccharomycetes?
- j) Give an example of Basidiomycetes.

SECTION-B

2. Describe the occurrence and general features of Vaucheria.
3. Write short notes on Saprolegnia.
4. Explain fungal toxins and their health effects.
5. Discuss the agricultural importance of cyanobacteria (Nostoc).
6. Explain the structural features of Neocallimastix.

SECTION-C

7. Explain in detail the life cycle and somatic structure of Neurospora.
8. Describe the environmental and biotechnological applications of fungi.
9. Discuss the control, symptoms, and epidemiology of subcutaneous fungal infections.



may - 2026

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Total No. of Pages : 02

Total No. of Questions : 09

Bachelor of Science / Honours (Microbiology) (Sem.-4)

FOOD AND DAIRY MICROBIOLOGY

Subject Code : BSMB-405-20

M.Code : 92103

Date of Examination : 15-05-2026

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

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3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :
- a) Milk is an excellent bacteriological culture medium. Explain.
 - b) What are some industrial processes that use bacteria?
 - c) What do you mean by pickling? Mention its uses.
 - d) What is mold-ripened cheese? Give two examples.
 - e) Contamination of meat.
 - f) Fermented food.
 - g) SCPs.
 - h) Biomass recovery.
 - i) Fermented milk.
 - j) Balanced diet.



May - 2026

SECTION-B

2. Discuss the types of mushrooms and their production technique.
3. Explain the role of enzymes like protease and amylase in food processing.
4. Discuss the microbiology of traditional fermented foods.
5. Explain the physicochemical properties of milk and its standards in India.
6. Discuss the various Food Preservation Techniques.

SECTION-C

7. Describe the microbiology and production process of fermented milk products like yogurt.
8. Explain the production techniques and applications of value-added dairy products like cream powder and cheese spread.
9. Write a brief note on newer concepts in dairy products.

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Total No. of Questions : 09

Subject Code: BSMB607/20

M.Code: 92523

Date of Examination: 14-06-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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SECTION-A

1. Write briefly:
 - a) What is Biofertilizer?
 - b) Characteristic features of Biofertilizer.
 - c) Sterilization
 - d) Write the role of Carriers in biofertilizer manufacturing process.
 - e) Azotobacter fertilizer
 - f) What are the characteristic features of mycorrhizae?
 - g) How biofertilizers differ from chemical fertilizers
 - h) Example of liquid biofertilizers.
 - i) Botanical pesticides
 - j) Is there any pathogenic relationship in mycorrhiza? Explain.



SECTION-B

2. Discuss the role of biopesticides in integrated pest management.
3. Describe the production process of bacterial biofertilizers, highlighting the steps involved in strain selection and fermentation.
4. Analyze the potential limitations in the production and application of biofertilizers in agriculture.
5. Compare and contrast the characteristics of different types of biofertilizers, including bacterial, cyanobacterial, and fungal biofertilizers.
6. Explain the importance of quality control and marketing strategies for biofertilizers.

SECTION-C

7. Evaluate the efficacy of botanical pesticides compared to chemical pesticides, considering factors such as environmental impact and resistance development.
8. Discuss the significance of carrier-based biofertilizers in enhancing soil fertility and crop productivity.
9. Assess the potential of mycorrhizal fungi as biofertilizers, emphasizing their role in nutrient uptake and plant growth promotion

may - 2026

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Total No. of Questions : 09

PLANT MICROBIAL INTERACTIONS

M.Code : 92521

Date of Examination : 11-05-2026

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

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SECTION-A

- 1. Write briefly :**

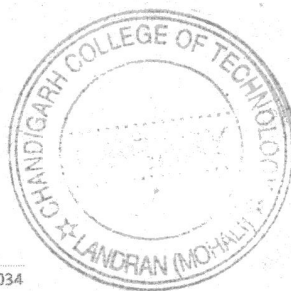
- a) Rhizosphere
- b) Exotoxins
- c) Microbial interactions
- d) Phytohormones
- e) Plant disease
- f) Symbiosis
- g) Lichens
- h) Microorganisms as food
- i) Mutualism
- j) Dairy Products

SECTION-B

2. Write a short note on Nitrogen fixation.
3. Differentiate between Endotoxins and Exotoxins
4. Discuss nutrients and microbial defence mechanisms
5. Write a brief note on plant defense mechanism against microbes.
6. Give an account on Root-root interaction and Root microbe interaction.

SECTION-C

7. Discuss the contribution made by different scientist in plant microbial interaction.
8. Give an account on various plant extract and their role in antifungal agents.
9. Discuss multitude functions of microbial consortia in rhizosphere with emphasis on phytohormones.



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[illegible]

Total No. of Questions: 09

MICROBIAL BIOTECHNOLOGY

M.Code: 92519

Date of Examination :08-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES :

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2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C will comprise of THREE questions students have to attempt any TWO questions.

SECTION-A

1. Write briefly :
 - a) What is the significance of biodiversity conservation?
 - b) How do aeration and oxygen transfer in a bioreactor system?
 - c) Enlist the various applications of biogas.
 - d) Define growth stoichiometry.
 - e) What is the principle of fermenter design?
 - f) Define PUFA.
 - g) What is gasohol?
 - h) Briefly mention baker's yeast.
 - i) Define growth efficiency.
 - j) What are probiotics? Give examples.



SECTION-B

2. Describe the process of mushroom cultivation.
3. Explain the types of fermentation process.
4. Write a short note on the efficiency of microbial growth and product formation.
5. Discuss the applications of microbes in industrial biotechnology.
6. How do nutraceuticals contribute to overall health and wellness?

SECTION-C

7. Explain in detail hollow fibre bioreactors and immobilized cell reactors.
8. Discuss the design, instrumentation and working of stirred tank bioreactor.
9. Write a detailed note on waste utilization to generate biofuels.

may - 2026

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may - 2026

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Total No. of Questions : 09

B.Sc. Honours (Microbiology) (Sem.-5)

BIOSAFETY AND INTELLECTUAL PROPERTY RIGHT

Subject Code : BSMB-505-20

M.Code : 92511

Date of Examination : 09-06-2026

Time : 3 Hrs.

Max. Marks : 30

INSTRUCTIONS TO CANDIDATES :

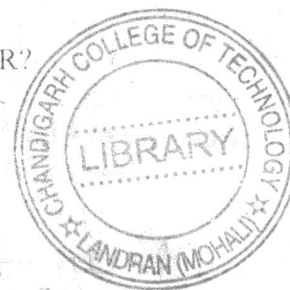
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SECTION-A

1. Write briefly :

- What is toxicology?
- Define the term "superbugs."
- What is meant by Z-value in sterilization?
- Name two methods of sterilization other than heat sterilization.
- What is Primary Containment for biohazards?
- Define Biosafety.
- What is the function of a Biosafety Level 4 laboratory?
- Define Industrial Design under IPR.
- What is a Patent?
- What do you mean by protection of GMOs under IPR?

may - 2026



SECTION-B

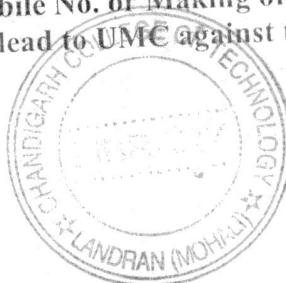
2. Explain the role of Quality Control and Quality Assurance in the pharmaceutical industry.
3. Write a note on filter sterilization and its applications.
4. Explain the historical background of biosafety and its need.
5. Describe the composition and functions of the Institutional Ethics Committee.
6. Discuss the importance of protecting plant varieties as a part of Intellectual Property.

SECTION-C

7. Explain the concept of NABL and ISO in quality management systems.
8. Describe the different methods of radiation and gaseous sterilization.
9. Explain the various types of Intellectual Property Rights with examples.

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May-2026



Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc - Honours (Microbiology) (Sem.-5)

ENZYME TECHNOLOGY

Subject Code : BSMB509-20

M.Code : 92515

Date of Examination : 11-06-2026

Time : 3 Hrs.

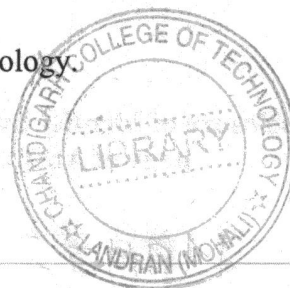
Max. Marks : 60

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SECTION-A

1. **Write briefly :**
 - a) Mention any two effects of temperature on enzyme activity.
 - b) What is the Michaelis–Menten constant (K_m)
 - c) Write any two applications of immobilized enzymes.
 - d) What is competitive inhibition?
 - e) Differentiate between reversible and irreversible inhibition.
 - f) Explain the term “turnover number” of an enzyme.
 - g) Write any two differences between activators and inhibitors.
 - h) What are isoenzymes? Give one example.
 - i) Define feedback inhibition with an example.
 - j) Mention two enzyme-based tests used in microbiology.



may-2026

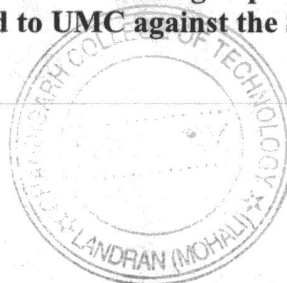
SECTION-B

2. Explain feedback inhibition and enzyme repression induction mechanism.
3. Derive the Michaelis–Menten equation and discuss the significance of K_m value.
4. Differentiate between competitive, non-competitive, and uncompetitive inhibition with examples.
5. Write a note on immobilized enzymes and mention their industrial applications.
6. Discuss the role of microbial enzymes in industrial and environmental processes.

SECTION-C

7. Elaborate the operon model of enzyme induction and repression, and explain how gene regulation controls enzyme synthesis.
8. Discuss the methods of enzyme immobilization, their advantages, and applications in large-scale bioprocesses.
9. Explain in detail the clinical and environmental applications of enzyme-based tests, with examples illustrating their role in disease diagnosis and pollution monitoring.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Sc- Honours (Microbiology) (Sem.-5)

IMMUNOLOGY

Subject Code : BSMB501-20

M.Code : 92507

Date of Examination : 19-06-2026

Time : 3 Hrs.

Max. Marks : 60

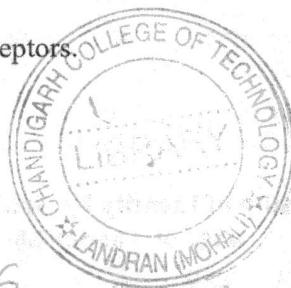
INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION - A

1. Write briefly :

- (a) State the difference between innate and acquired immunity.
- (b) Mention the characteristics of immunogens.
- (c) Draw the labelled diagram of antibody.
- (d) Define epitope.
- (e) Classify various types of hypersensitivity reactions.
- (f) What is immunogenicity?
- (g) What are adjuvants? Give an example of adjuvants.
- (h) Mention any two functions of bone marrow.
- (i) Write a short note on pattern recognition receptors.
- (j) What are cytokines?



May 2026

SECTION-B

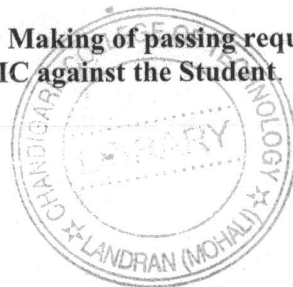
2. Explain the structure and function of the major histocompatibility complex.
3. What are hypersensitivity reactions? Describe type I and type II hypersensitivity reactions in detail.
4. Give a detailed overview of graft rejection.
5. Briefly discuss about MALT and GALT.
6. Discuss in detail about immune system and its various components.

SECTION-C

7. Why ELISA is performed? Explain the principles, types, and applications of ELISA.
8. What are antibodies? Discuss in detail about its various types and functions.
9. Give a detailed account on Complement System, its components and activation pathways.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Sc - Honours (Microbiology) (Sem.-5)

COMPUTER SCIENCE AND BIOINFORMATICS

Subject Code : BSMB 507-20

M.Code : 92513

Date of Examination : 16-06-2026

Time : 3 Hrs.

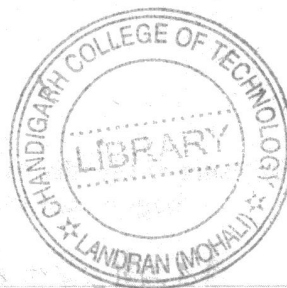
Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :
- a) Define CPU.
 - b) Give two examples for data storage.
 - c) Define Protein.
 - d) What are output devices?
 - e) Define database.
 - f) Define bioinformatics.
 - g) What do you mean by sequence alignment?
 - h) Define FASTA.
 - i) Give one use of BLAST.
 - j) Mention one difference between RAM and ROM.



May - 2026

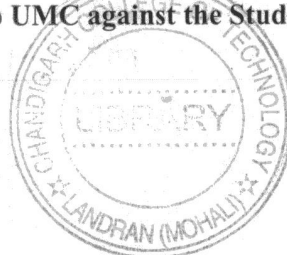
SECTION-B

2. Describe the role of Bioinformatics in microbial diagnostics.
3. Write a note on evolution of Computing devices.
4. Briefly discuss about data submission tools.
5. Give an account of Phylogenetic trees constitution.
6. Enlist basic concepts of Computer organization.

SECTION-C

7. Discuss in detail about functional units of computer system with neat diagram.
8. Describe salient features of BLAST.
9. Explain in detail about Sequence alignment and its types.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. Honours (Microbiology) (Sem.-5)

MEDICAL MICROBIOLOGY

Subject Code : BSMB 503-20

M.Code : 92509

Date of Examination : 13-06-2026

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

- a) Define carriers and give types.
- b) What is septic shock?
- c) Write two examples of respiratory bacterial diseases.
- d) What is meant by host-pathogen interaction?
- e) Write the full scientific name of the bacterium causing tetanus.
- f) Give one example each of RNA and DNA virus.
- g) What is meant by antibiotic resistance?
- h) Define antimicrobial agent.
- i) What is meant by multidrug resistance (MDR)?
- j) Define prophylaxis.



May - 2026

SECTION-B

2. Write a short note on Giardiasis and Amoebiasis.
3. Explain the mechanism of action of any two antibacterial agents.
4. Describe the mechanism of septicemia and its clinical significance.
5. Discuss sample collection and transport methods in clinical microbiology.
6. Give the mechanism of action of antiviral agents.

SECTION-C

7. Explain the process of pathogenesis, transmission, and control measures of Mycobacterium tuberculosis.
8. Explain bacterial identification methods with examples and their importance in diagnosis.
9. Discuss the pathogenesis, transmission, and control of HIV/AIDS.

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