Roll No. | | | | | | | | | | |

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (Microbiology) (Sem.–4)

PHYCOLOGY AND MYCOLOGY

Subject Code : BSMB-401-20

M.Code : 92099

Date of Examination : 26-05-2023

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) Significance of Phialopore in Volvox

   b) Mycotoxins

   c) Nostoc

   d) Symptoms of Candidiasis infection

   e) Lichens

   f) Cryptococcus

   g) Phaeophyceae

   h) Economic Importance of fungi

   i) Role of algae in food

   j) Mycology.

SECTION-B

2. Depict the life cycle of Pencillium with the help of labelled diagrams only. Write its systematic position.

3. Why are Myxomycetes classified as fungi?

4. Discuss economic importance of algae. What are the relationship between cyanophyta and chlorophyta?

5. Write a brief note on classification of algae.

6. Write a brief note on systemic infection.

SECTION-C

7. Describe the variation in thallus organization in various Chlorophyceae algae.

8. Give an account of fungi classification based on various important criteria.

9. Elaborate symptoms, pathogenesis, transmission and control of Subcutaneous infection.

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Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. Honours (Microbiology) (Sem–2)

FUNDAMENTALS OF BIOCHEMISTRY

Subject Code : BSMB-203-19

M.Code : 79874

Date of Examination: 30-05-2023

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 ionization with suitable examples.

b) Draw Haworth projection formula for fructose.

c) What are sphingolipids?

d) What are galactolipids?

e) Define proteoglycans with suitable examples.

f) What are coenzymes?

g) Enlist any four properties of peptide bond.

h) Give any two examples of homopolysaccharides.

i) Differentiate between reducing and non-reducing sugars

j) What are nucleotides?

SECTION-B

2. Explain in detail stereoisomerism of monosaccharides.

3. Write a detailed note on effect of acid and alkali on DNA.

4. Give detailed classification of lipids.

5. Write a brief note on UV absorption by nucleic acids.

6. Give sources, properties and functions of fat-soluble vitamins.

SECTION-C

7. Classify vitamins. Write a detailed note on coenzymes.

8. Classify carbohydrates and give suitable examples from each class including their chemical structures.

9. Explain the structure of mRNA, tRNA and rRNA.

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Roll No. | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. Honours (Microbiology) (Sem–2)

MICROBIAL PHYSIOLOGY AND METABOLISM

Subject Code : BSMB-207-19

M.Code : 79878

Date of Examination : 02-06-2023

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) What do you mean by continuous culture?

   b) What do you mean by group translocation?

   c) What is fermentation?

   d) What is the effect of temperature on microbial growth?

   e) Differentiate between Phototrophy and Chemotrophy.

   f) What is P:O Ratio?

   g) What is secondary transport?

   h) What do you mean by Denitrification?

   i) Define Methanogenesis.

   j) Define Microbial Biofilms.

SECTION-B

2. Discuss the various factors which are affecting microbial growth.

3. What is microbial mobility? Give a brief account on organs and its functions,

4. Write a note on TCA Cycle.

5. What are the components of respiratory chain?

6. Describe in detail mechanism of photosynthesis.

SECTION-C

7. Explain in detail the process of Biological Nitrogen Fixation. How do nitrogen fixers protect their nitrogenase from oxygen toxicity?

8. Discuss the fate of pyruvate in aerobic respiration.

9. Explain the oxidative pentose phosphate pathway and its significance in microbial metabolism.

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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 : 05-06-2023

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. **Answer briefly:**

a) In what manner bacterial cells organized?

b) Write the name of different component of bacterial cell membrane.

c) Differentiate between Bright Field and Dark field Microscope.

d) What is Serial dilution?

e) Give an example of gram positive and gram negative bacteria.

f) Enlist the different techniques for microbial control?

g) What temperature and pressure should be maintained during bacterial growth?

h) Define Scanning Electron Microscope.

i) Define the term nanoarchaeum.

j) How bacteria perform their metabolism.

SECTION-B

2. Draw a labeled diagram and write the different stages of sporulation in bacteria with an example.

3. How to cultivate the anaerobic bacteria and in what manner they are differ from aerobic bacteria.

4. Suppose you had the choice of destroying one class of organic compounds in bacterial cells to prevent their spread which class would you choose. Why?

5. By what standards are bacteria classified? Name the classifications.

6. What are the various chemical methods of microbial control?

SECTION-C

7. Discuss in detail the composition and structure of gram positive and gram negative cell wall.

8. Write a detailed note on various physical method of microbial control.

9. Explain in brief the different bacteriological techniques for their cultivation.

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Roll No. | | | | | | | | | | |

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. Hons. (Microbiology) (Sem–2)

MOLECULAR BIOLOGY

Subject Code : BSMB-205-19

M.Code : 79876

Date of Examination : 07-06-2023

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. **Answer briefly :**

   a. Define replicon.

   b. How does RNA differ from DNA?

   c. What is transfer RNA?

   d. How many initiation factors are involved in protein synthesis?

   e. What is excision repair?

   f. What is meant by RNA splicing?

   g. Write the concept of introns.

   h. Differentiate between RNA primer and DNA primer.

   i. DNA replication fork is symmetric or asymmetric type, why?

   j. Where is bacterial site specific recombinase tool used?

SECTION-B

2. Briefly explain alternative forms of DNA helix.
3. What are the basic differences between DNA and RNA?
4. Explain the DNA replication in prokaryotes.
5. Briefly explain the term RNA polymerases.
6. How does protein synthesis occur in prokaryotes?

SECTION-C

7. Elaborate the transcription process of prokaryotes.
8. Highlight the steps involved in the translation of prokaryotes.
9. Explain the structure of Watson and Crick model of DNA and Z-DNA.

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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 : 09-06-2023

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) Discuss the applications of enzyme technology.

b) Define holoenzyme.

c) Define IU.

d) What do you mean by coenzyme?

e) What is Km?

f) Define feedback inhibition.

g) Discuss the actual meaning of competitive inhibition.

h) What are allosteric enzymes?

i) Enlist enzyme-based products available in the market.

j) Highlight the relation of enzyme technology with microbiology.

SECTION-B

2. Mention enzyme turnover number and specific activity.

3. Elaborate on the mechanism of enzyme action with a justified diagram.

4. Describe about enzyme repression induction operon model.

5. Differentiate between reversible and irreversible inhibition.

6. Discuss applications of microbial enzymes in the environment.

SECTION-C

7. Discuss in detail the factors affecting enzyme activity enzyme concentration.

8. Mention in detail the application of enzyme-based tests in microbiology for the biochemical analysis of microorganisms.

9. What do you know about immobilized enzymes and their industrial applications?

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Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

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

BIOSAFETY AND INTELLECTUAL PROPERTY RIGHT

Subject Code : BSMB505-20

M.Code : 92511

Date of Examination : 08-06-23

Time : 3 Hrs. Max. Marks : 30

INSTRUCTIONS TO CANDIDATES :

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

SECTION-A

1. **Write briefly :**

   a. Trademark

   b. D Value

   c. Institutional ethics committee

   d. What is WIPO and its main role?

   e. Role of Quality control in pharmaceuticals

   f. Mechanism of cold sterilization

   g. Biohazards

   h. Geographical indication in IPR

   i. Gases used in gaseous sterilization

   j. Protection of plant varieties in IPR

SECTION-B

2. What is ISO 9000:2015 and its benefits.
3. Explain the survival curve in sterilization process.
4. Discuss the various biosafety levels.
5. Explain IPR and its types.
6. Discuss sterility testing.

SECTION-C

7. Discuss the history of patent development in India starting from its inception.
8. Explain the term Bio-Safety Levels (BSL). Briefly point out the various BSL and their significance in laboratory setup.
9. Explain the role of GLP in pharmaceutical industry.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

Roll No. ______________ Total No. of Pages : 02

Total No. of Questions : 09

B.Sc- Honours (Microbiology) (Sem–5)

IMMUNOLOGY

Subject Code : BSMB-501-20

M.Code : 92507

Date of Examination : 10-06-2023

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) Discuss mononuclear phagocytes.

b) Define MALT.

c) Define haptens.

d) What do you mean by avidity?

e) What are the symptoms of antigen-antibody interactions?

f) Discuss the tonsils.

g) What do you mean by antigens?

h) What is adaptive immunity?

i) Define transplantation.

j) Mention the role of cytokines,.

SECTION-B

2. Discuss in detail the antigen processing and presentation.

3. Elaborate in detail about major Histocompatibility complexes.

4. Describe in detail about autoimmunity -organ specific and systemic.

5. Define epitopes. Give a detailed comment.

6. Give a overview of graft rejection.

SECTION-C

7. **Discuss the following :**

a) Granulocytic cells

b) Spleen

c) Antigen binding sites

8. Discuss in detail about ELISA with their applications.

9. **Comment on :**

a) Cytokines: receptors

b) Immunodeficiency

c) Thymus and lymph node.

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Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐ Total No. of Pages : 02

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 : 16-12-22

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. Copyright

   b. Z value

   c. Role of biosafety committee

   d. Provisional filing of patent

   e. Role of Quality Assurance in pharmaceuticals

   f. Mechanism of filtration sterilization

   g. Head office and sub branches of Patent office

   h. Biological safety cabinets

   i. Allergenicity

   j. Safety precaution in microbiology lab.

SECTION-B

2. Explain the objective and scope of NABL.

3. What are Copyright authorities and what are its benefits?

4. Enlist the methods used in dry heat sterilization and explain the mechanism of microbial destruction.

5. Discuss the recommended biosafety levels for infectious agents.

6. Explain the protection of GMOs IP as a factor in R&D.

SECTION-C

7. Briefly explain Good Laboratory practices (GLP) in pharmaceutical industry.

8. Describe briefly PCT and its process.

9. Briefly explain the objective and method for sterility testing.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

Roll No. | | | | | | | | | | | | Total No. of Pages : 02

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 : 16-12-22

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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   h. Biological safety cabinets

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Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐ Total No. of Pages : 02

Total No. of Questions : 09

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

COMPUTER SCIENCE AND BIOINFORMATICS

Subject Code : BSMB507-20

M.Code : 92513

Date of Examination : 19-12-22

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) Discuss the CPU functions.

   b) Define DNA.

   c) Define BLAST

   d) What do you mean by data submission tools?

   e) What is FASTA?

   f) Define file formats.

   g) Discuss the input/output devices.

   h) What are the various storages devices?

   i) Enlist the application of computer sciences in bioinformatics.

   j) Highlight the functional units and their interrelation.

SECTION-B

2. Mention the basic computer organization.
3. Elaborate on the phylogenetic trees constitution for microbial diversity.
4. Describe about database similarity search.
5. Mention the multiple sequence alignment for studying microbial diversity.
6. Discuss the various fundamentals of computers.

SECTION-C

7. Discuss in detail about stored programs and applications of database similarity search.
8. Mention in detail about limitations of bio-information's and protein sequence database.
9. What do you know about pair wise sequence alignments and structure databases.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

Roll No. | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 09

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

COMPUTER SCIENCE AND BIOINFORMATICS

Subject Code : BSMB507-20

M.Code : 92513

Date of Examination : 19-12-22

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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Roll No. [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ] Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. Hons. (Microbiology) (Sem.–1)

INTRODUCTION TO MICROBIOLOGY

Subject Code : BSMB-101-19

M.Code : 78979

Date of Examination : 10-01-2023

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) Enlist the contributions of R. Koch in microbiology.

   b) Write two examples for gram negative bacteria.

   c) What is dark field microscopy?

   d) Define sporulation process.

   e) What is nutritional biodiversity?

   f) Classify virus.

   g) What is diauxic growth?

   h) Name physical agents used to kill the microbes.

   i) Define pasteurization process.

   j) What is fermentation?

SECTION-B

2. Elaborate about the microbial interaction like antibiosis.
3. Discuss the aerobic and anaerobic fermentation.
4. What is generation time and growth of bacteria?
5. Difference between gram positive and gram-negative bacteria.
6. Write down the principle of fluorescent microscopy.

SECTION-C

7. Write the contribution of various scientists in the history of microbiology.
8. Classify the fungi and the role of nitrogen fixing microbe in agriculture.
9. Elaborate about the feature of the microbes in extreme environment like high temperature and high/low pH.

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Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐ Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. Hons. (Microbiology) (Sem.–1)

INTRODUCTION TO MICROBIOLOGY

Subject Code : BSMB-101-19

M.Code : 78979

Date of Examination : 10-01-2023

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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Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐ Total No. of Pages : 02

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B.Sc. Hons. (Microbiology) (Sem.–1)

INTRODUCTION TO MICROBIOLOGY

Subject Code : BSMB-101-19

M.Code : 78979

Date of Examination : 10-01-2023

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

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Roll No. [ ]

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. Hons. (Microbiology) (Sem.–1)

INTRODUCTION TO MICROBIOLOGY

Subject Code : BSMB-101-19

M.Code : 78979

Date of Examination : 10-01-2023

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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   i) Define pasteurization process.

   j) What is fermentation?

SECTION-B

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Roll No. | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (Microbiology) (Sem.–4)

PHYCOLOGY AND MYCOLOGY

Subject Code : BSMB401-20

M.Code : 92099

Date of Examination : 05-07-22

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) Significance of Auxospores in diatoms

   b) Neurospora

   c) Chara

   d) Symptoms of Histoplasma infection.

   e) Microsporum

   f) General characters of Cyanobacteria

   g) Biofuel

   h) Economic Importance of algae

   i) Applications of fungi in medicine

   j) Phycology.

SECTION-B

2. Write a brief note on opportunistic infection.

3. Discuss the occurence and life cycle of Coleochaete.

4. Elaborate pathogenesis and transmission of Trichophton.

5. Explain in brief true slime molds.

6. Discuss lichens as indicator of pollutions. What are the interrelationship of phycobiants and mycobiants?

SECTION-C

7. Elaborate symptoms, pathogenesis, transmission and control of dermatophytoses infection.

8. Write a brief note on occurence, somatic structure and life cycle of Neocallimastix fungi.

9. Discuss occurence, thallus organization and life cycle of Polysiphonia algae.

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Roll No. | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (Microbiology) (Sem.–4)

AGRICULTURAL MICROBIOLOGY

Subject Code : BSMB-403-20

M.Code : 92101

Date of Examination : 07-07-22

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) Soil Microbiology

   b) Immobilization

   c) Nitrogen fixation

   d) Biofertilizer

   e) Enzymes

   f) Elicitors

   g) Phytotoxins

   h) Protozoa

   i) Soil microbes

   j) Toxins.

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SECTION-B

2. Discuss the role of PR-proteins and growth regulators in plant-microbe interactions.
3. Write a brief note on ammonia assimilation in nitrogen fixing legume modules.
4. Describe the process of Mineralization, Immobilization and Adsorption in relation transformations of phosphorous cycle.
5. Discuss the biology of Peronospora and TMV.
6. Define cyanohacferia (BGA) and thetr association in nitrogen fixation.

SECTION-C

7. Describe the role of plant growth regulators in plant pathogenesis.
8. Write brief note on microbial interaction with plants.
9. Elaborate the role of pathogen enzyme in pathogenesis and production of different enzyme.

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Roll No. | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT) (Sem.–6)

MEDICAL MICROBIOLOGY

Subject Code : BSBT-152-18

M.Code : 79463

Date of Examination : 18-07-22

Time : 3 Hrs.

Max. Marks : 40

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
2. SECTION-B contains FIVE questions carrying TWO & HALF 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. What are bacterial toxins?

   b. Disease caused by *H. influenzae*.

   c. Name one fungal infection.

   d. Genetic material of Retroviruses.

   e. An agent of subcutaneous infection.

   f. What is localized infection?

   g. What leads to secondary infections?

   h. Explain virulence factors.

   i. Name one Pox Virus.

   j. Which pathogen causes Typhoid?

SECTION-B

2. Discuss the pathogen that causes Giardiasis.
3. Briefly explain the gram positive bacteria morphology.
4. Describe the salient features of Tricophyton.
5. Discuss the pathology of Aspergillosis.
6. Write the symptoms of Tuberculosis.

SECTION-C

7. Write a note on the symptoms and preventive measures of *C.botulinum*.
8. How does Hepatitis infection lead to liver cirrhosis?
9. Describe the salient features of Orthomyxoviruses.

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Roll No. | | | | | | | | | | |

Total No. of Questions : 09 Total No. of Pages : 02

B.Sc. (Microbiology) (Sem.–4)

FOOD AND DAIRY MICROBIOLOGY

Subject Code : BSMB-405-20

M.Code : 92103

Time : 3 Hrs. Date of Examination : 11-07-22

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) What do you understand by the term *'lyophilisation'*?

b) Enlist applications of vinegar in food technology.

c) Explain the term *'ripening'* of cheese.

d) State two applications of amylase in food industry.

e) How does lactobacillus cause curdling of milk?

f) Enlist some of the harmful mushrooms.

g) Which enzymes are used in brewing industry?

h) What are osmophilic microorganisms?

i) Mention the microorganisms used for the production of tempeh and tofu.

j) State contributions of Louis Pasteur in microbiology.

June-2022

SECTION-B

2. Write a brief note on the extrinsic factors affecting microbial growth in food.

3. a) Differentiate between radappertization and radurization.

   b) How does radiation affect microbial activity in food?

4. What do you understand by the term pickling? Explain the physicochemical changes which occur in food after pickling process.

5. Explain the importance of lactase enzyme in dairy technology.

6. With reference to the new concept in dairy technology, write short notes on the following :

   a) Cream powder

   b) Lactose powder.

SECTION-C

7. Define single cell proteins. Discuss any two methods of SCP production, and importance of single cell proteins.

8. Write detailed note on the method used for mushroom production. Also describe the different types and significance of mushroom cultivation in India.

9. Describe the composition of milk. State the environmental and biological factors affecting composition of milk.

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Roll No. [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] Total No. of Pages : 02

Total No. of Questions : 09

B.Sc- Honours (Microbiology) (Sem.–5)

IMMUNOLOGY

Subject Code : BSMB-501-20

M.Code : 92507

Date of Examination : 12-12-22

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) Discuss GALT.

   b) Define ELISA.

   c) Define TCR genes.

   d) What do you mean by B cell generation?

   e) What are the symptoms of hypersensitivity?

   f) Discus the CALT.

   g) What do you mean by antigens?

   h) What is T-cell maturation?

   i) Definite transplantation.

   j) Mention antibody affinity.

SECTION-B

2. Discuss in detail the basic structure and function of antibodies.
3. Elaborate in detail about major histo compatibility complexes.
4. Describe in detail :

   a) TCR genes

   b)T cell receptor complex.

5. Define epitopes. Give a detailed comment.
6. Discuss primary and secondary lymphoid organs and their functions.

SECTION-C

7. **Discuss the following :**

   a) T-dependent and T-independent antigens.

   b) Antigen binding sites.

   c) Pattern recognition receptors.

8. Discuss in detail radio immunology assay and also justify ELISA.
9. **Comment on :**

   a) Cytokines: receptors

   b) Immunodeficiency

   c) Thymus and lymph node.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

Roll No.

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. Honours (Microbiology) (Sem.–3)

VIROLOGY

Subject Code : BSMB-301-19

M.Code : 90367

Date of Examination : 12-12-22

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) Draw T4 Phage structure.

    b) Name the stages of infection.

    c) What is SV40 virus?

    d) Difference between enveloped and non-enveloped virus.

    e) What are the salient features of wound tumor virus?

    f) What are interferons?

    g) Write down general principle of viral vaccination.

    h) What is capsid symmetry?

    i) What is host specific defence mechanism?

    j) Write down application of phages.

SECTION-B

0 0 JUN 2022

0 0 DEC 2022

2. What is infection? Write down various stages of Infection.

3. Write down the replication pattern of Rhabdo Virus.

4. Broadly explain Lambda Temperate phage with Structure, Lytic & Lysogenic cycle.

5. Write down the origin of viruses with its general properties.

6. What are anti-viral compounds and explain their mode of action?

SECTION-C

7. Classify Viruses. Explain the isolation, purification and cultivation of viruses.

8. Draw the life-cycle and replication strategies of Hepatitis Virus.

9. Briefly discuss following:

    a. What are Interferons?

    b. Write down the general principles of Viral Vaccination.

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Roll No. | | | | | | | | | | | 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 : 14-12-22

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) Discuss invasion.

   b) Define parasites.

   c) Define opportunistic infections.

   d) What do you mean by septicemia?

   e) What are the symptoms of gastrointestinal diseases caused by *Vibrio cholera*?

   f) Discuss the Herpes virus.

   g) What are the symptoms of COVID-19?

   h) What are antimicrobial agents?

   i) What are blood-borne infections?

   j) Mention the symptoms of the disease caused by Staphylococcus aureus.

SECTION-B

2. Discuss in detail about inhibition of cell wall synthesis in concern with anti-microbial agents.

3. Elaborate on the anti-viral agent with special reference to Acyclovir and Amantadine.

4. Describe in detail retroviruses.

5. Define giardiasis and also comment on gastrointestinal infections.

6. Discuss the inhibitors of cell metabolism.

SECTION-C

7. Define antibacterial agent. Mention their modes of action with a special focus on inhibitors of nucleic acid synthesis and inhibitors of cell membrane function.

8. Discuss in detail the collection, transport, and culturing of clinical samples.

9. What do you know about the antiviral agent? With relevant examples and mechanisms.

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Total No. of Questions : 09

B.Sc- Honours (Microbiology) (Sem.–3)

MICROBES IN ENVIRONMENT

Subject Code : BSMB-305-19

M.Code : 90371

Date of Examination : 16-12-22

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) Give the structure of an ecosystem.

   b) What is soil profile?

   c) Define ruminants.

   d) What is the role of osmotic pressure in extremophiles?

   e) What is amensalism in microbial interaction?

   f) Define parasitism.

   g) Define commensalism.

   h) Enlist the methods of solid waste disposal.

   i) What is the role of COD in waste management?

   j) Write a procedure for a septic tank.

SECTION-B

2. Write in detail aeromicroflora and the dispersal of microbes?

3. Explain the habits of microbes at different temperatures, salinity, and low level of nutrients.

4. Write in detail microbe animal interaction.

5. Explain the composition and strength of liquid waste management.

6. Write down the methods used for primary sewage treatment.

SECTION-C

7. Explain detailed about solid waste management.

8. Describe the function of the ecosystem as well as the terrestrial environment.

9. Describe symbiotic and non-symbiotic interactions with examples.

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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 : 19-12-22

Time : 3 Hrs. Max. Marks : 30

INSTRUCTIONS TO CANDIDATES :

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

SECTION-A

1. **Write briefly :**

   a) Define allergens.

   b) Examples of airborne bacteria

   c) What is CFU?

   d) Write examples of culture media used for fungi.

   e) Significance of air sampling in OT.

   f) How air sampling is done?

   g) Examples of water-borne diseases.

   h) Full form of MPN test.

   i) How treatment of water is done?

   j) Size of membrane filter.

SECTION-B

2. Give a detailed procedure for air sampling?
3. Write the significance of bioaerosols in operation theatres?
4. Explain the role of CFU in air sampling?
5. Write methods to detect the probability of the water sample?
6. Write down the complete test for water microbes?

SECTION-C

7. Write a detailed note on the microbial analysis of water.
8. What is the impact of airborne microbes on human health and the-environment?
9. Illustrate various culture media used for bacteria and fungi.

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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 : 21-12-22

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) Discuss the apoenzyme.

   b) Define activators.

   c) Define enzyme specificity.

   d) What do you mean by enzyme inhibitors.

   e) What is the significance of Km.

   f) Define feedback inhibition.

   g) Discuss the actual meaning of competitive inhibition.

   h) What are isoenzymes.

   i) Enlist enzyme-based products available in the market.

   j) Mention the meaning of the active site.

SECTION-B

2. Mention the general features of enzymes.
3. Elaborate on the mechanism of enzyme action with a justified diagram.
4. Describe the derivation of Michele's mentioned equation for substrate reaction.
5. Differentiate between competitive and non-competitive inhibition.
6. Discuss applications of microbial enzymes in the industrial process.

SECTION-C

7. Discuss in detail the factors affecting substrate concentration, pH, and temperature.
8. Mention in detail about :

   a) Line weaver burk plot

   b) Enzyme repression induction operon model

9. What do you know about enzyme technology and its industrial applications?

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Roll No. | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

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

BIOSTATISTICS

Subject Code : BSMB308-19

M.Code : 90374

Date of Examination : 21-12-22

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) What do you mean by parametric test?

   b) Define biostatistics.

   c) What do you mean by standard deviation?

   d) Define skewness and kurtosis.

   e) Define t-test

   f) Calculate mean, median and mode for 30, 16, 20, 16, 18, 14, 24, 18

   g) Define variables.

   h) Define Shannon-weaver index.

   i) How do you calculate range?

   j) What do you mean by statistical power?

SECTION-B

2. Explain chi-square test- goodness of fit.
3. Define paired sample t-test. Write its significance in research.
4. Define errors. Give its importance in research.
5. Find out the coefficient of correlation from the following data:

   X: 65, 66, 65, 67, 68, 69, 71, 73

   Y: 67, 68, 68, 68, 72, 70, 69, 70

6. Define simple linear regression. Add a note on spearman's correlation.

SECTION-C

7. Define hypothesis. Write a detailed note on hypothesis testing.
8. Define Mann-Whitney U Test. Write its significance in research. Explain with example.
9. To carry out one factor analysis of variance of the given observations of three different methods of teaching. Find out the mean difference between the groups and state the hypothesis, **[alpha level: 0.05, F= 5.41]**

Online Teaching	Teaching through Multimedia device	Traditional Method
5	5	6
3	4	4
4	6	4

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Roll No. | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. - Honours (Microbiology) (Sem.–1)

BASICS OF BIOSCIENCES

Subject Code : BSMB-107-19

M.Code : 78985

Date of Examination : 17-01-2023

Time : 3 Hrs. Max. Marks : 30

INSTRUCTIONS TO CANDIDATES :

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

SECTION-A

1. **Write briefly :**

   a) Define Taxonomy

   b) Define Fungi

   c) Define Cell theory

   d) Define Cell Cycle

   e) Inflorescence

   f) What are the different types of RNA found in cell?

   g) Name the different types of tissues

   h) Mitochondria

   i) Annual rings in plants

   j) Kingdom Monera.

SECTION - B

2. Why is cell called the basic unit of life?
3. Why is Kingdom Fungi not grouped with plants?
4. Explain the role of connective tissue in animals.
5. Give general account of plant kingdom.
6. Discuss Anatomy of Plants in general.

SECTION-C

7. Explain the biological system of classification.
8. Write a note on the structural organization in Animals.
9. Discuss morphology of Flowering plants.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

Roll No. | | | | | | | | | | |

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (Hons.) (Microbiology) (Sem.–1)

CELL BIOLOGY

Subject Code : BSMB-105-19

M.Code. : 78983

Date of Examination : 14-01-2023

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 a cell, and who was the first to discover a non-living cell.

   b. What are protein filaments, and mention their name?

   c. Define a suicidal bag.

   d. What do you understand with the term freeze drying?

   e. How a plant cell is different from an animal cell?

   f. Define cell differentiation.

   g. Write down the functions of cytosol.

   h. Enlist the phases of the cell cycle.

   i. Write the difference between RER and SER.

   j. What is microtome and write its utility.

SECTION-B

2. Discuss the functions of the nucleus.
3. Explain the process of mitosis.
4. Elaborate on a different level of cell organization.
5. Write down the process of cell senescence and death.
6. Write a short note on cell locomotion.

SECTION-C

7. Explain the structure and functions of any four cell organelles.
8. Write a detailed note on the cytophotometric method and embedding.
9. Define cell and write a short note on the theory of cell.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (Hons.) (Microbiology) (Sem.–1)

CELL BIOLOGY

Subject Code : BSMB-105-19

M.Code. : 78983

Date of Examination : 14-01-2023

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 a cell, and who was the first to discover a non-living cell.

   b. What are protein filaments, and mention their name?

   c. Define a suicidal bag.

   d. What do you understand with the term freeze drying?

   e. How a plant cell is different from an animal cell?

   f. Define cell differentiation.

   g. Write down the functions of cytosol.

   h. Enlist the phases of the cell cycle.

   i. Write the difference between RER and SER.

   j. What is microtome and write its utility.

SECTION-B

2. Discuss the functions of the nucleus.
3. Explain the process of mitosis.
4. Elaborate on a different level of cell organization.
5. Write down the process of cell senescence and death.
6. Write a short note on cell locomotion.

SECTION-C

7. Explain the structure and functions of any four cell organelles.
8. Write a detailed note on the cytophotometric method and embedding.
9. Define cell and write a short note on the theory of cell.

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Roll No. | | | | | | | | | | | |

Total No. of Pages : 03

Total No. of Questions : 09

B.Sc. Honours (Microbiology) (Sem.–1)

CHEMISTRY-I

Subject Code : BSMB-103-19

M.Code : 78981

Date of Examination : 12-01-2023

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 Heisenberg's uncertainty principle.

b) Write down Schrodinger wave equation.

c) Write down electronic configuration of Na atom.

d) Draw the chemical structure of 2-methyl-l-cyano butane.

e) Define heterolytic fission with suitable example.

f) Give two examples of carboanions.

g) Write down the example of conformational isomers of any organic compounds.

h) Define diastereomers with suitable example.

i) What is achirotopic centre? Give example.

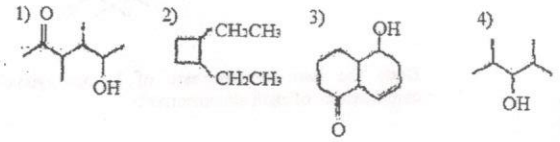
j) Define optical isomerism.

SECTION-B

2. Draw all constitutional isomers of C_4H_9Br and identify the isomer(s) that possess chirality centers.

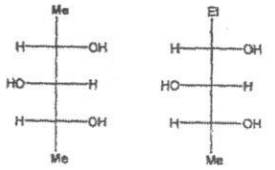
3. Write short notes on Pauli's exclusion principle and Hund's rule of maximum multiplicity.

4. Determine the number of stereoisomers for the following compounds and explain your answer:



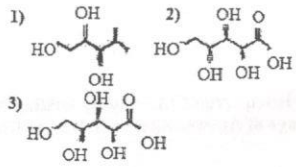
5. Draw both chair conformations for each of the following compounds. In each case, identify the more stable chair conformation: (i) Methylcyclohexane; (ii) trans-1,2-Di isopropylcyclohexane.

6. Draw bond line structures using wedges and dashes for the following compounds:



SECTION-C

7. Draw a Fischer projection for each of the following compounds, placing the CO_2H group at the top:



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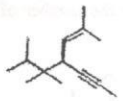
8. An aqueous solution containing 10 g of optically pure fructose was diluted to 500 mL with water and placed in a polarimeter tube 20 cm long. The measured rotation was found as –5.20°. Calculate the specific rotation of fructose. If the solutions were mixed with 500 mL of a solution containing 5 g of racemic fructose; what would be the specific rotation of the resulting fructose mixture? What would be its optical purity?

9. Assign the configuration of the chirality center in the following compound:



Draw the two stereoisomers of 3-isopropylcyclohexanol. Which is more stable conformation of each stereoisomer?

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.