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M.Sc. (BT) (Sem.-1)

COMPUTER APPLICATIONS

Subject Code : MBT-105

M.Code : 75663

Date of Examination : 25-05-2023

Time : 3 Hrs. Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

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

SECTION-A

1. Explain the following :

   a) RAM

   b) Application Software

   c) $345_{10} = ?_2$

   d) Variable

   e) Operator ++

   f) String

   g) While Loop

   h) Record

   i) Class and Object

   j) Superscript.

SECTION-B

2. Describe the block structure of a computer in detail.
3. Write a program to check weather a number is prime or not.
4. Write a note on arrays with example.
5. Differentiate between class and object. How much memory is used by them?
6. Differentiate between call by value and call by reference.
7. Write a note how to insert a table and graphs in word processing?
8. Explain any 5 arithmetic formulas with help of example.

SECTION-C

9. Define constructors. Explain its types with help of example.
10. Write a program to overload 'operator'.
11. Define database. Discuss the advantages of database over file system.

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M.Sc. (BT) (Sem.-1)

GENETICS AND MOLECULAR BIOLOGY

Subject Code : MBT-103

M.Code : 75661

Date of Examination : 16-05-23

me : 3 Hrs. Max. Marks : 70

ISTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains SEVEN questions carrying SIX marks each and students have to attempt any FIVE 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) Epistasis.

   b) Dihybrid tests.

   c) Transposons

   d) Klinefelter Syndrome.

   e) Structure of Nucleosomes.

   f) Leucine Zipper Motif of transcription Factor.

   g) Rep protein.

   h) RNA Polymerase of E.coli.

   i) Operator Sequence in prokaryotic genes.

   j) Protein Hydroxylation.

SECTION-B

2. Describe initiation of translation in E.coli.
3. Explain how Lod Score helps in establishing Linkage.
4. Describe the process of replication of Telomeres in eukaryotes.
5. Discuss regulation of Trp operon in E.coli.
6. Describe the processing of secretary proteins in eukaryotes.
7. Describe the regulation of protein gradients during embryonic development of drosophila.
8. Describe gene mapping by linkage analysis.

SECTION-C

9. Discuss post translational chemical modifications of proteins.
10. Describe various types of RNA Polymerases in eukaryotes and their transcription processes.
11. Explain regulation of process of translation in eukaryotes.

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M.Sc. (BT) (Sem.-1)

BIOMOLECULES AND METABOLISM

Subject Code : MBT-101

M.Code : 75659

Date of Examination : 20-05-2023

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

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

SECTION-A

1. Attempt all parts :

a) How t-RNA is different from m-RNA?

b) Distinguish anomers and epimers.

c) What is the fate of pyruvate formed through glycolysis?

d) Name the intermediates of citric acid cycle which are converted into amino acids.

e) What is enzyme code?

f) What is meant by enzyme turn over?

g) Write the structure of N-acetylglucosamine.

h) Name any two unsaturated fatty acids.

i) Write the structure of sucrose.

j) What are sterols?

SECTION-B

2. Write a note on pyruvate dehydrogenase complex.

3. Write a brief note on pentose phosphate pathway.

4. Describe the structure of eukaryotic ribosomes.

5. Write a brief note on sphingolipids.

6. Write a brief note on storage polysaccharides.

7. Discuss briefly glycoproteins.

8. Write a note on mitochondrial electron transport chain.

SECTION-C

9. Discuss in detail how enzyme activity is regulated?

10. Describe oxidation of unsaturated fatty acids.

11. Describe how metabolism is coordinated and regulated.

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M.Sc (BT) (Sem.-1)

ENVIRONMENT BIOTECHNOLOGY

Subject Code : MBT-111

M.Code : 75664

Date of Examination : 18-05-2023

Time : 3 Hrs. Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

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

SECTION-A

1. Describe briefly :

a) What are aerated lagoons?

b) How pathogenic microorganisms are detected in water?

c) Distinguish between clarification and coagulation.

d) Define trickling filters.

e) What is meant by microbial leaching?

f) Define the role of organic farming in environment.

g) What is the nature of waste of dairy industry?

h) Name different sources of pollution of agricultural practices.

i) What is the role of oxidation ponds in waste water treatment?

j) How COD of waste water can be reduced?

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SECTION-B

2. Describe methods of bio-hydrogen production.

3. Write a brief note on phycoremediation.

4. Discuss briefly biodegradation of lignocelluloses.

5. Write a note on vermicomposting.

6. Discuss how distillery waste is treated before its discharge into the environment?

7. Write a note on wastewater treatment efficiency assessment.

8. What changes do occur during secondary and tertiary treatment of wastewater?

SECTION-C

9. Describe culture based approach for bioremediation. Discuss it vis-a-vis metagenomic approach.

10. Discuss municipal techniques for the prevention and treatment of biomedical wastes.

11. Discuss in detail about the feedstock(s) and mechanism of biodiesel production. What are the recent targets set by Government of India for biodiesel production and what are the limitations to achieve these targets?

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M.Sc. (BT) (Sem.-1)

APPLIED MICROBIOLOGY

Subject Code : MBT-102

M.Code : 75660

Date of Examination : 22-05-23

Time : 3 Hrs. Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

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

SECTION-A

1. **Describe briefly :**

a) Write characteristic features of Archeabacteria.

b) How tumor viruses are different from other viruses?

c) Write down the advantages of continuous cultures.

d) Distinguish between batch and fed batch microbial cultures.

e) What are the modes of virus entry into the host cells?

f) Define pathogenicity islands. Write down their molecular features.

g) When does a microrganism switch to secondary metabolite production?

h) Write three important diseases of veterinary animals and their causal organisms.

i) Write names of two microorganisms important for the commercial production of (i) ethanol (ii) organic acids and (iii) antibiotics.

j) What is meant by mathematical modelling of microbial growth?

SECTION-B

2. Discuss in brief how was it established that diseases are caused by microorganisms?
3. Describe how microorganisms are screened for the production of new metabolites?
4. Discuss physical factors affecting growth of microorganisms.
5. Describe molecular mechanism of fungal disease development in plants.
6. Describe the role of pathogenicity islands in bacterial virulence.
7. Discuss briefly metabolite genes and their functions.
8. Write a brief note on food additives and their advantages.

SECTION-C

9. Write a detailed note on bacterial quorum sensing and its role in virulence.
10. Write down the steps involved in microbial strain improvement through mutations.
11. Discuss in detail steps involved in microbial secondary metabolite production at commercial level.

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M.Sc. (Biotechnology) (Sem-2)

BIOPROCESS ENGINEERING

Subject Code : MBT-205

M.Code : 76249

Date of Examination : 02-06-2023

Time : 3 Hrs. Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

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

SECTION-A

1. **Write short note on the following :**

   a) Sterilization and pasteurization

   b) Generation time

   c) Biocolours and bioflavours

   d) Fermented foods with examples

   e) Liquid-liquid extraction

   f) Reverse osmosis

   g) VVM

   h) Pneumatic fermenters and their applications

   i) Primary and secondary metabolites.

   j) Submerged and surface fermentation with examples.

SECTION-B

2. Principle and applications of centrifugation.
3. Explain the process of cryopreservation for maintenance of microorganisms.
4. How bio-transformation is better than chemical transformation? Explain with examples.
5. Describe batch, fed batch and continuous systems in detail.
6. Explain the construction of fermenter with the help of diagram.
7. Describe the principle of ultrafiltration and factors affecting it.
8. Describe the applications of bacteriocins in food preservation.

SECTION-C

9. What are up-streaming and down-streaming processes in bioprocesses? Explain different steps involved in up-streaming and down-streaming of any bioprocess.
10. Describe the different phases of microbial growth curve with the help of diagram in detail.
11. How industrial waste materials can be used as substrates for the production of useful products? Explain with the help of examples.

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M.Sc.(BT) (Sem-2)

IMMUNOLOGY AND IMMUNOTECHNOLOGY

Subject Code : MBT-202

M.Code : 76246

Date of Examination : 05-06-2023

Time : 3 Hrs. Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains SEVEN questions carrying SIX marks each and students have to attempt any FIVE 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) Phagocytes

b) Class switching

c) Oncogenes

d) Celiac disease

e) Agglutination

f) Antibody diversity

g) Receptors of cytokines

h) Phases of B-cell maturation

i) Cancer induction

j) Sandwitch ELISA.

SECTION-B

2. Discuss about types and functions of antibodies.
3. What are various receptors and co-receptors on T cell?
4. Explain any three cytokine related diseases and their therapies.
5. Describe cancer immunotherapy in detail.
6. Define Transplantation. What are the reasons of graft rejection?
7. Write a short note on Hybridomas technology.
8. Write down about principle and applications of immune electrophoresis.

SECTION-C

9. Explain molecular structures of antibodies. Discuss briefly purification of antibodies.
10. Give an account off genomic organization and regulation of MHC expression.
11. What are different types of immunodiagnostics? Give applications too.

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M.Sc. (BT) (Sem-2)

ENZYME TECHNOLOGY

Subject Code : MBT-203

M.Code : 76247

Date of Examination : 09-06-2023

Time : 3 Hrs. Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

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

SECTION-A

1. Describe briefly :

   a) Pingpong reaction

   b) M-M equation

   c) Isomerase enzyme

   d) Coenzyme

   e) Serine protease

   f) Uncompetitive inhibition

   g) Oligomeric enzyme assay

   h) Allosteric enzyme

   i) Active site structure determination

   j) Briggs-Haldane modification.

SECTION-B

2. How are enzymes classified? Mention an example of each class.
3. Discuss briefly kinetics of multisubstrate reactions catalysed by an enzyme.
4. Give role of allosteric enzyme in metabolic regulation.
5. Write a short note on enzymes as reagents.
6. Write down about trapping of enzyme substrate complex.
7. Describe lactate dehydrogenase and its reaction mechanism.
8. How would you prepare an immobilized enzyme? Explain with an example.

SECTION-C

9. Discuss in detail about extraction and purification of an enzyme.
10. What are the different types of enzyme inhibition? Explain with examples.
11. Give an account of application of enzymes.

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M.Sc. (BT) (Sem-3)

ANIMAL TISSUE CULTURE

Subject Code : MBT-311

M.Code : 76733

Date of Examination : 24-05-2023

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains SEVEN questions carrying SIX marks each and students have to attempt any FIVE 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) Warm trypsinization

   b) Cell synchronization

   c) Membrane filtration

   d) In-situ hybridization

   e) Anchorage dependent cells

   f) Cell banking

   g) Viability measurement

   h) HAT selection

   i) Cell line immortalization

   j) Serum free media

SECTION-B

2. What are the various requirements to set-up a primary culture?
3. Write down about role of serum in animal tissue culture media.
4. How would you sterilize media in animal tissue culture?
5. Discuss about role of enzymes in cell separation.
6. Write a note on cell line designation.
7. What is flow cytometry? Give principle and applications.
8. Explain various applications of monoclonal antibodies.

SECTION-C

9. Enlist some industrial products of animal cell culture. Also add a note on c culture of animal cell.
10. Give an account of cryopreservation of cell lines.
11. What are the components of animal tissue culture media? Give detail.

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M.Sc. (Biotechnology) (Sem-2)

BIOPROCESS ENGINEERING

Subject Code : MBT-205

M.Code : 76249

Date of Examination : 02-06-2023

Time : 3 Hrs. Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

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

1. **Write short note on the following :**

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   c) Biocolours and bioflavours

   d) Fermented foods with examples

   e) Liquid-liquid extraction

   f) Reverse osmosis

   g) VVM

   h) Pneumatic fermenters and their applications

   i) Primary and secondary metabolites.

   j) Submerged and surface fermentation with examples.

SECTION-B

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7. Describe the principle of ultrafiltration and factors affecting it.
8. Describe the applications of bacteriocins in food preservation.

SECTION-C

9. What are up-streaming and down-streaming processes in bioprocesses? Explain different steps involved in up-streaming and down-streaming of any bioprocess.
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