Exam Code: 120603 **Paper Code: 3192**

Programme: Bachelor of Science (Bio-Technology)

Semester – III

Course Title: Fundamentals of Biotechnology

Course Code: BBTL- 3061

Time Allowed: 3 Hours **Max. Marks: 60**

Instructions for students:
Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. Each question carries 12 marks.

Section – A

1. (a) Explain the role of contributing sciences and technologies in growth and development of Biotechnology? (6 marks)

(b) Briefly explain the role of Yeast and Arabidopsis thaliana as tools of biotechnology / Rec-DNA technology? (3 marks)

(c) Name a few Biotechnological institutes of India? Also gave their achievements and contributions to field of Biotechnology, in brief? (3 marks)

2. What are the various tools used in recombinant DNA technology? Explain with reference to restriction enzymes, cloning vectors and any one heterologous protein production process? (12 marks)

Section – B

3. Write detailed note on
(a) Production of Rec- Hepatitis vaccine (b) Aquaculture (12 marks)

4. (a) Explain the complete process for the production of genetically engineered food known to you? (6 marks)

(b) What are biofuels? Give production method of any one such biofuel studied by you? (6 marks)

Section – C

5. a) Explain the differences between patentable and non-patentable inventions? What is the effect of these two types of inventions on business outcomes? (6 marks)

b) What do you know about IPR? Write a brief note on patents related with SNPs, medicinal plants and microbes? (6 marks)

6. Write a detailed note complete process of patenting? Citing requirements, objective, process and filing of patent? Give examples and flow charts of process where-ever needed? Also write a few lines on plant breeder's rights? (12 marks)

Section – D

7. What do you know about various ethical issues and deterrents against commercialization of Genetically modified foods/organisms? What are the various rules an regulations governing uses and applications of stem cell therapy? (12 marks)

8. a) Give detailed public opinion on the issues of human cloning?

b) How the GMOs can be used in bioremediation of industrial wastes?

c) Briefly write a note on future of Biotechnology in India?

(3 x 4= 12 marks)

Exam Code: 120603 **Paper Code: 3193**

Bachelor of Science (Bio-Technology) (Semester-III)

Course Title: Immunology-I

Course Code: BBTL-3062

Examination Time: 3Hrs **Marks: 60**

Note: Attempt 5 questions, selecting atleast one from each of section each section. Fifth Question can be attempted from any section. Each Question carries Twelve marks.

Section A

1. a) What is Innate immunity? How it is different from Adaptive Immunity?
   b) Discuss features of Immune response (6,6)
2. a) Explain the following terms Humoral Immunity, Primary Immune response, Epitope, Avidity (6)
   b) Differentiate between active and passive immunization (6)

Section B

3. Write a note on
   a) MALT (6)
   b) Spleen (6)
4. a) What are primary Lymphoid organs? Explain the structural features of any one primary lymphoid organ with suitable diagram? (8)
   b) What are the major structural features of T cells and their types? (4)

Section C

5. Write a note on complement classical pathway. (12)
6. a) Draw the structure of antibody and label its different parts. (4)
   b) What is immunogenicity? Discuss the factors influencing immunogenicity. (8)

Section D

7. Explain the structure of
   a) MHC Class I molecules (6)
   b) T-cell antigen receptors (6)
8. How antigen is processed and presented by MHC Class II molecules? (12)

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Exam Code: 120603 **Paper Code: 3194**

Programme: Bachelor of Science (Bio-Technology)

Semester – III

Course Title: Chemistry - II

Course Code: BBTL- 3083

Time Allowed: 3 Hours **Max. Marks: 40**

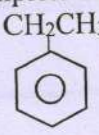
Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. Each question carries 8 marks.

Section – A

1. (a) Which of the reaction intermediate has two unpaired electrons on it? Write its characteristics and structure. (3)
   (b) What are free Radicals? Give two methods of preparation. (3)
   (c) Explain the stability of two types of carbenes. (2)
2. (a) Explain the stability of primary, secondary and tertiary carbocations on the basis of Hyperconjugation. (3)
   (b) Which is more Acidic: Formic Acid or Acetic Acid? Explain. (2)
   (c) What are the conditions for Hydrogen bonding? Explain which is more volatile and why of O-nitrophenol and p-nitrophenol? (3)

Section – B

3. (a) What are σ & π complexes in electrophilic substitution reactions of Benzene? Explain. (3)
   (b) How will you convert Benzene to Acetophenone? Give mechanism and name the reaction. (3)
   (c) Complete the reaction and name the type of reaction:



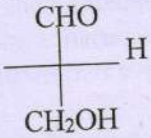
$+ Br_2 \xrightarrow{\text{light}} ?$ (2)

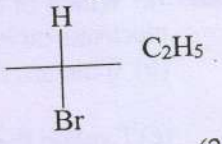
4. (a) Chlorine is ortho- , para – directing but deactivate the Benzene Ring. Explain. (3)
(b) Give Sulphonation reaction of Benzene with mechanism. (3)
(c) How will you prepare m – nitrobenzoic acid from Toluene? (2)

Section – C

5. (a) What is a Racemic mixture? Give three methods of Resolution of Racemic mixture. (3)
(b) What is inversion of configuration? Give example. (2)
(c) Define Meo-compounds and diastereomers. Discuss their optical activity with one example each. (3)

6. (a) Assign 'R'/ 'S' configuration to the following:

i. 

ii. 

(2)

(b) How will you detect 'E' & 'Z' configurations in different isomers on the basis of Dipole – moment, Melting point & Boiling point? (3)
(c) What are Absolute and Relative configurations? Explain with examples. (3)

Section – D

7. (a) What is meant by SN^1 & SN^2 mechanism? Discuss with examples. (4)
(b) How the reaction pathways can be varied by changing the reaction conditions in Nucleophilic substitution reactions? (4)

8. (a) Explain the factors influencing SM^1 mechanism. (4)
(b) Explain the stereochemistry & rearrangement in SN – Reactions. (4)

C.O.E office (Mor) 7/12/24 (1/RMV-II)

Exam Code: 120603 **Paper Code: 3195**

Programme: Bachelor of Science (Biotechnology)

Semester: III

Course Title: Botany - II

Course Code: BBTL-3074

Time Allowed: 3 Hours **Max Marks: 40**

Note:- Attempt five questions in all, selecting at least one question from each section. Fifth question may be attempted from any section. Each question carries 8 marks.

Section - A

1. a) Define transpiration. Explain factors affecting the rate of transpiration. 4

   b) What is osmotic pressure? Discuss the factors affecting osmotic potential. 4

2. Describe the adaptations with respect to salt and cold stress in plants. 8

Section - B

3. Describe the Mechanism of Electron transport chain in plants. 8
4. a) Discuss the two photosystems and their role in photosynthesis. 4

   b) Distinguish between C3 and C4 cycle 4

Section - C

5. Give the casual agents, symptoms with suitable diagrams and control measure **any two** diseases:
   a. Loose smut of wheat
   b. Yellow mosaic of bhindi
   c. Red rot of sugarcane
6. Explain the following: 4+4
   a. PR proteins b. Phytoalexins 4+4

Section - D

7. Discuss about **any two** of the following with suitable examples and diagrams: 4+4
   a. Commensalism b. Mutualism c. Parasitism
8. Write a note on population growth curve and its types. 8

C.O.E 12/12/24 (Morn) KMV = II

Exam Code: 120603 **Paper Code: 3196**

Programme: Bachelor of Science (Bio-Technology)

Semester-III

Course Title: Biochemistry-III

Course Code: BBTL- 3085

Time Allowed: 3 Hours **Max Marks: 60**

Note: Candidates are required to attempt five questions in all, selecting atleast one question from each section. The fifth question may be attempted from any section. Each question carries 12 marks.

Section-A

1. Write a detailed note on gluconeogenesis.
2. Explain feeder's pathways for glycolysis.

Section-B

3. Discuss the mechanism of oxidative phosphorylation.
4. Write a detailed note on respiratory inhibitors.

Section-C

5. Describe the process of lipid digestion and how lipids are absorbed in the digestive system.
6. Describe the process of triacylglycerol degradation and its significance in lipid metabolism.

Section-D

7. What are the main pathways for cholesterol synthesis, and why is cholesterol important for cellular function?
8. How are phosphoglycerides synthesized, and what roles do they play in cellular membranes?

Exam Code: 120603 **Paper Code: 3197**

Programme: Bachelor of Science (Bio-Technology)

Semester-III

Course Title: Molecular Biology

Course Code: BBTL- 3066

Time Allowed: 3 Hours **Max Marks: 60**

Note: Candidates are required to attempt five questions in all, selecting atleast one question from each section. The fifth question may be attempted from any section. Each question carries 12 marks.

Section-A

1. Discuss the DNA replication in eukaryotes with diagrams. (12)
2. Discuss the following:
   a) DNA polymerases (6)
   b) Fidelity of replication (6)

Section-B

3. Write a note on:
   a) Bacterial transposons (6)
   b) Holiday junction model (6)
4. Discuss mechanism and importance of DNA repair. (12)

Section-C

5. Explain the role of RNA polymerase, promoter and transcription factor in eukaryotes. (12)
6. Define splicing. Diagrammatically discuss tRNA and rRNA splicing. (12)

Section-D

7. Explain mechanism of inhibition and regulation of translation. . (12)
8. Discuss post translation modifications with examples. (12)