

Printing Pages : 2

Paper Code: B110401T

C

(SVSU:2024-25/R)

Enrollment No.

B.Sc. Biotechnology, Microbiology, Biochemistry

2nd Year/ IV Semester

Enzymology & Immunology (B110401T)

Time: 3:00 Hours

Max. Marks: 75

Note: 1. Attempt all the questions as per given instructions.

2. Fill the correct answer of MCQs.

1. Multiple Choice Questions (MCQs)

[01×15=15]

I Macromolecules class belongs to enzymes is

- a) Lipids b) Proteins c) Carbohydrates d) Nucleic acids

II What is the role of enzymes in biological systems?

- a. To store genetic information
b. To regulate body temperature
c. To catalyze chemical reactions d. All of above.

III Immunoglobulin-A is a

- a. Monomer b. Dimer c. Pentamer d. None

IV Interferons inhibit replication of

- a. Bacteria b. Virulence c. Virons d. None

V Which of the following is/are not phagocytic cell in nature?

- a. T-cells b. Monocytes c. Macrophages d. None

VI Who is called the father of vaccination?

- a. Louis Pasteur b. Robert Koch c. Edward Jenner d. none

VII Hybridoma technology is formation of

- a. MAbs b. PAbs c. Abs d. Igs

VIII TSH is secreted from

- a. Pituitary b. Thyroid c. Thymus d. None

IX Endocrine factors which promote autoimmunity are

- a. Female hormone b. Male hormones
c. Both a&b d. None

X Name of virus used for vaccine production is

- a. Vaccinia b. Papilloma
c. Virginia d. Mosaic Virus

XI Enzymes lower the activation energy by:

- A. Consuming energy B. Changing the products
C. Stabilizing the transition state D. Modifying the substrate

[1]

XII Mast cells are having receptors for

- a. IgG b. IgA c. IgD d. None

XIII Km is defined as:

- A. Maximum rate of enzyme action
B. Half the substrate concentration at V_{max}
C. The enzyme's molecular weight
D. The product concentration

XIV DNA vaccines are based on

- a. Pathogenic gene b. Split gene
c. Pseudo gene d. None

XV What is used for culture of hybridoma cell production?

- a. PEG b. TAG c. HAT d. HGT

2. Answer in long (any three)

[10×3=30]

I Describe the classification of enzymes with examples and their EC numbers.

II Give a brief description on secondary lymphoid organs with suitable diagrams.

III Derive the Michaelis-Menten equation and explain the significance of different kinetic plots.

IV Give a brief account on structure&types of Immunoglobulins.

3. Answer in short (any six)

[5×6=30]

I Differentiate between antigenicity and immunogenicity.

II Write a short note on Psycho-neuroimmunology.

III Explain the concept of enzyme-substrate specificity.

IV Can you explain why female are dominant for autoimmunity.

V Describe Inflammatory barrier.

VI What are co-factors. Explain various types of co-factors and their roles by taking suitable examples.

VII What is MHC? Explain with suitable example.

VIII Explain Fisher's Lock and Key Hypothesis and how it is different from Koshland's induced fit hypothesis.

IX Explain competitive and non-competitive inhibition along with their kinetic significance.

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Printing Pages : 3

Paper Code: B080401T

A

(SVSU:2024-25/R)

Enrollment No.

Program Name: B.Sc. (Biotechnology/Microbiology/Biochemistry)

IVth Semester / IInd Year Examination

Subject Code: B080401T

Subject Name: Molecular Biology and Microbial Genetics

[Time: 3 Hours]

[Max. Marks: 75]

Note: 1. Attempt all the questions as per given instructions.

1. Multiple Choice Questions (MCQs) [1×15=15]

- I Which histone protein is responsible for linking nucleosomes together?
A. H1 B. H2A C. H3 D. H2
- II What happens to the lac operon when lactose is absent?
A. The repressor binds to the operator, blocking transcription.
B. RNA polymerase binds and transcribes the genes.
C. Lactose directly binds to the promoter, activating the operon.
D. The operon remains continuously active.
- III In *E. coli*, which enzyme is primarily responsible for removing RNA primers during DNA replication?
A. DNA polymerase I B. DNA polymerase III
C. Helicase D. Ligase
- IV Which of the following proteins helps in unwinding DNA at the origin of replication in eukaryotes?
A. DNA ligase B. DNA polymerase δ
C. MCM complex D. PCNA
- V In translation, the Shine-Dalgarno sequence in prokaryotes is important for:
A. Binding of tRNA to the ribosome
B. Termination of translation
C. Binding of mRNA to the small ribosomal subunit
D. Charging of tRNA with amino acids
- VI Which of the following best describes plasmids in prokaryotes?
A. Linear DNA molecules integrated into the chromosome
B. Circular DNA molecules that replicate independently of chromosomal DNA
C. RNA molecules involved in transcription
D. Essential components of the prokaryotic ribosome

- VII** What is the primary function of selectable marker genes in plasmids used in molecular cloning?
- Enhance plasmid replication
 - Integrate the plasmid into host DNA
 - Allow identification of cells that have taken up the plasmid
 - Inhibit transcription of foreign genes
- VIII** Which statement about plasmids in eukaryotic cells is true?
- All eukaryotic cells naturally contain plasmids
 - Plasmids in eukaryotes are primarily used in mitochondrial function
 - Eukaryotic plasmids replicate in the same manner as prokaryotic chromosomes
 - Plasmids are not naturally found in most eukaryotic cells but can be introduced experimentally
- IX** Which of the following best describes horizontal gene transfer?
- Gene transfer from parent to offspring
 - Gene transfer between individuals of the same generation
 - Gene duplication within the same organism
 - Mutation of existing genes
- X** In bacterial transformation, DNA is taken up from:
- A bacteriophage
 - A conjugative plasmid
 - The environment
 - The host chromosome
- XI** Which structure is essential for bacterial conjugation?
- Flagellum
 - Nucleoid
 - Fimbriae
 - Sex pilus
- XII** In transduction, genes are transferred between bacteria via:
- Transformation
 - Plasmids
 - Pili
 - Bacteriophages
- XIII** Which of the following physical agents can cause mutations by inducing pyrimidine dimers in DNA?
- X-rays
 - UV radiation
 - Gamma rays
 - Alpha particles
- XIV** Which of the following chemical mutagens causes mutations by acting as a base analog?
- Ethidium bromide
 - 5-Bromouracil
 - Aflatoxin B1
 - Formaldehyde
- XV** The Ames test is used to detect:
- DNA polymerase activity
 - Mutagenic potential of chemicals
 - Bacterial conjugation efficiency
 - Protein expression levels

[2]

- 2. Answer in long (any three)** [10×3=30]
- Explain the process of DNA replication in prokaryotes, emphasizing the functions of key enzymes and detailing the synthesis of both the leading and lagging strands.
 - Explain the process of translation in prokaryotes and explain key stages: initiation, elongation, and termination.
 - Describe the various DNA repair mechanisms in prokaryotic cells, focusing on the processes of nucleotide excision repair and mismatch repair.
 - Describe the regulatory mechanisms of the *lac* and *trp* operons, explaining how lactose controls the *lac* operon and how tryptophan influences the *trp* operon.
- 3. Answer in short (any six)** [6×5=30]
- How does the presence of tryptophan affect the *trp* operon?
 - Why is DNA polymerase III considered the main replicative enzyme in *E. coli*?
 - What is the role of the TATA box in eukaryotic transcription initiation?
 - Name the enzyme responsible for synthesizing the RNA primer during DNA replication in *E. coli*.
 - Why are plasmids useful tools in genetic engineering and molecular cloning?
 - How does the Shine-Dalgarno sequence aid in translation initiation in prokaryotes?
 - What happens to the *lac* operon when glucose is absent and lactose is present in *E. coli*?
 - What is a silent mutation, and why does it not affect the resulting protein?

[3]

Printing Pages :2

Paper Code: B100401T

C (SVSU:2024-25/R)

Enrollment No.

B.Sc. Biotechnology, Microbiology, Biochemistry

2nd Year/ IV Semester EXAMINATION

Microbiology & Immunology

(B100401T)

[Time: 3:00 Hours]

[Max. Marks: 75]

Note: 1. Attempt all the questions as per given instructions.

1. Multiple Choice Questions (MCQs)**[01×15=15]****I Name of virus used for vaccine production is**

- a. Vaccinia b. Papilloma c. Virginia d. Mosaic Virus

II Which of the following is not a requirement for microbial growth?

- a. Moisture b. Nutrients. c. Oxygen d. UV light

III Immunoglobulin-M is a

- a. Monomer b. Dimer c. Pentamer d. None

IV Interferons inhibit replication of

- a. Bacteria b. Virulence c. Virons d. None

V Which of the following is/are not phagocytic cell in nature?

- a. T-cells b. Monocytes c. Macrophages d. None

VI Who is called the father of vaccination

- a. Louis Pasteur b. Robert Koch c. Edward Jenner d. none

VII Hybridoma technology is formation of

- a. MAbs b. PABs c. Abs d. Igs

VIII TSH is secreted from

- a. Pituitary b. Thyroid c. Thymus d. None

IX Endocrine factors which promote autoimmunity are

- a. Female hormone b. Male hormones c. Both a&b d. None

X Macromolecules class belongs to enzymes is

- a) Lipids b) Proteins c) Carbohydrates d) Nucleic acids

XI Which of the following is not a common symptom of waterborne diseases?

- a) Skinrashes b) Diarrohea c) Vomiting d) Headache

XII Mast cells are having receptors for

- a. IgG b. IgA c. IgD d. IgE

XIII Which component of the Gram stain acts as the mordant?

- a) Crystal violet b) Iodine c) Alcohol d) Safranine

XIV Which of the following is not a characteristic of a good culture medium?
a. Sterility b. Nutrient composition c. pH d. Complexity

XV Which of the following is not a method of microbial control in healthcare
a. Hand hygiene b. Vaccination c. Quarantine d. Chemical disinfection

2. Answer in long (any three) [10×3=30]

- I** Give a brief description on MAbs production technology.
- II** Explain about various nutrient categories of microorganisms?
- III** Describe about cell- mediated immunity.
- IV** Give a brief account on principles & applications of sterilization methods.

3. Answer in short (any six) [5x6=30]

- I** What do you know about fermentation?
- II** Write a short note on TB
- III** Write brief account on AIDS.
- IV** Can you explain why female are dominant for autoimmunity.
- V** Describe Inflammatory barrier.
- VI** Complications of Myasthenia Gravis in humans.
- VII** What is MHC? Explain with suitable example.
- VIII** Write a brief note about graft rejection.
- IX** Differentiate between physical and chemical sterilization.

Printing Pages : 2

Paper Code: B080201T

A

(SVSU:2024-25/R)

Enrollment No.

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B.Sc. Microbiology/Biotechnology/Bio-Chemistry/Environmental Science

I Year, II Semester Examination

B080201T

Agriculture and Environmental Microbiology

[Time : 3:00 Hours]

[Max. Marks : 75]

Note: 1. Attempt all the questions as per given instructions.

1. Objective Questions: Answer All Questions. [15x1=15]

- I. Some amount of elemental carbon was utilized by the microorganisms during Bio Geo chemical cycle. The phenomenon is called as
 - a) Dissimilation b) Immobilization
 - c) Decomposition d) Neutralization
- II. Sexually produced spore is
 - a) Conidia b) Sporangiospores c) Ascospores d) None of these
- III. The example for symbiotic association is
 - a) E.coli in intestine of man b) Lichens
 - c) Normal flora of skin d) All of the above
- IV. The enzymes responsible for decomposition is
 - a) Lipolytic b) Proteolytic c) Lysozyme d) Both a and b
- V. Cellulase are produced from
 - a) S.cereviceae b) A. nigar c) Trichoderma Koningi d) None of these
- VI. Raw-material used for the production of alcohol is
 - a) Molasses b) Starch c) Sulphite waste water d) All of thes
- VII. The process by which nitrogen gas is converted into ammonia by bacteria is known as:
 - a) Nitrogen fixation b) Nitrification
 - c) Denitrification d) Ammonification
- VIII. Who is known as the father of Microbiology?
 - a) Edwin John Butler b) Ferdinand Cohn
 - c) Robert Koch d) Antoni van Leeuwenhoek
- IX. An enzyme found in our tears, saliva, serum, and mucus that degrades the peptidoglycan of the cell wall of Gram-positive bacteria is called
 - a) Amylase b) Lysozyme c) Keratinase d) Peptidase
- X. Cellulose is degraded to glucose by the enzyme
 - a) Cellulose dehydrogenase b) Hexokinase
 - c) beta-glucosidase d) Cellulase

XI. Bacterial cell grown on hydrocarbon wastes from the petroleum industry are a source of

- a) Fats b) Vitamins c) Carbohydrates d) Proteins

XII. Which of the following solid waste describe the term 'Municipal Solid Waste'?

- A) hazardous b) nonhazardous c) toxic d) all of these

XIII. Which environmental factor influences the growth of microorganisms in soil the most?

- a) Soil texture b) Soil pH
c) Soil temperature d) Soil organic matter

XIV. The process of converting organic substrate to protoplasmic carbon is

- a) Mineralization b) Assimilation c) Immobilization d) Nitrification

XV. Phosphorus is essential component of

- a) Phospholipids b) Teichoic acid
c) Nucleotides d) All of the mentioned

2. Long Question: Answer Any Three

[10×3=30]

- I. Write the detailed about Microbe-Animal interactions.
- II. Write the detailed about Mycorrhiza. Discuss about its application in agriculture.
- III. How microorganisms play an important role in cellulose, Hemicellulose and Lignin Degradation?
- IV. What do you mean by Solid waste? Discuss about solid waste management.

3. Short Questions: Answer Any Five.

[6×5=30]

- I. What is the Structure and function of Ecosystem?
- II. What do you mean by thermophillic Bacteria?
- III. Give the comments on Carbon Cycle with suitable diagram.
- VI. Explain the role of Bioremediation in degradation of common pesticides.
- V. What do you mean by Denitrification?
- VI. Give the short not on treatment of drinking Water
- VII. Describe the Liquid waste management process with suitable diagrams.

Printing Pages : 2

Paper Code: B100601T

B (SVSU:2024-25/R)

Enrollment No.

Program Name: B.Sc. Biotechnology

VI Semester / 3rd Year Examination

Subject Code: B100601T

Subject Name: INDUSTRIAL AND ENVIRONMENTAL
BIOTECHNOLOGY

[Time: 03:00 Hours]

[Max. Marks: 70]

Note: 1. Attempt all the questions as per given instructions.

2. Fill the correct answer of MCQs

1. Multiple Choice Questions (MCQs) [01×15=15]

I For the recovery of citric acid after fermentation, $\text{Ca}(\text{OH})_2$ is added to the slurry to

- A. Precipitate calcium B. Precipitate calcium citrate
C. Precipitate calcium phosphate
D. Precipitation calcium sulphate

II Bioethics is a field of _____

- A. Virtue ethics B. Ethics of care
C. Applied ethics D. Professional ethics

III Which is a genetically modified crop?

- A. Bt-Brinjal b. Bt-Cotton
c. Golden rice d. More than one of the above

IV Rhizobium is a free-living bacterium that fixes atmospheric nitrogen. A. True B. False

V Which one of the following is not a greenhouse gas found naturally in the atmosphere?

- A. Nitrogen oxide B. Carbon dioxide
C. Methane D. Ozone

VI Which of the following is the most common source of SCP?

- A. Multicellular yeast B. Single-celled yeast
C. Unicellular yeast D. Unicellular bacteria

VII Which of the following includes genetic engineering?

- A. Gene revolution B. Bloodless revolution
C. Globalization C. Green revolution

VIII Public health ethics is a branch of _____

- A. Medical ethics B. Bioethics C. Abortion D. Care

IX Spirit vinegar is produced from

- A. Fruit juices B. Malted grain C. Ethanol D. Ale

- X Which of the following algae can be grown on wastewater?**
 A. Spirogyra B. Volvox C. Spirulina D. Chlamydomonas
- XI The term 'Intellectual Property Rights' relates to:**
 A. Copyrights B. Know-how
 C. Trade dress D. All of the above
- XII Fungi has the capability of _____**
 A. Water B. Oxygen C. Carbon D. Potassium
- XIII Which of the following bacteria cannot fix atmospheric nitrogen?**
 A. Nostoc B. Anabaena C. Oscillatoria D. Lactobacillus
- XIV Which of the following is the secondary pollutant?**
 A. Carbon monoxide B. Smog
 C. Carbon dioxide D. Fly Ash
- XV Chlorofluorocarbons (CFCs) are also known as _____.**
 A. Chlorocarbon B. Fluoromethane C. Anisol D. Freon
- 2. Answer in long (any three) [10×3=30]**
- I What do you mean by screening of new metabolites? Explain in detail.**
- II What is the procedure for the production of microbial food and SCP?**
- III What do you mean by conventional fuels and what are their environmental impacts?**
- IV What is the environmental significance of genetically modified microbes, plants, and animals?**
- 3. Answer in short (any five) [5×5=25]**
- I How will you treat municipal waste and industrial effluents?**
- II What do you mean by bioleaching?**
- III What is the importance of IPR?**
- IV Differentiate between algal and fungal biofertilizers.**
- V What do you mean by strain development through selection, mutations, and recombination?**
- VI What is the degradation of lignin?**
- VII What are the components of the environment?**

Printing Pages : 2

Paper Code: B100201T

C

(SVSU:2024-25/R)

Enrollment No.

Program Name: B.Sc. (Biotechnology/Microbiology)

IInd Semester / Ist Year Examination

Subject Code: B100201T

Subject Name: Molecular Biology and Genetic Engineering

[Time: 3 Hours]

[Max. Marks: 75]

Note: Attempt all the questions as per given instructions.

1. Multiple Choice Questions (MCQs) [1×15=15]
 - I Western blotting is primarily used to detect:
 - A. DNA B. RNA C. Proteins D. Carbohydrates
 - II One major advantage of NGS over traditional Sanger sequencing is:
 - A. Requires no DNA polymerase B. Can sequence proteins directly
 - C. Can sequence millions of DNA fragments simultaneously
 - D. Does not require a DNA template
 - III Which enzyme in prokaryotes is primarily responsible for removing RNA primers and filling the gaps with DNA?
 - A. DNA polymerase I B. DNA polymerase II
 - C. DNA polymerase III D. DNA ligase
 - IV What is the origin of replication called in E. coli?
 - A. Ori-C B. Ori-T C. Ori-V D. Ori-R
 - V Which subunit of prokaryotic RNA polymerase is responsible for promoter recognition?
 - A. α -subunit B. β -subunit C. β' -subunit D. σ -subunit
 - VI Which RNA polymerase transcribes mRNA in eukaryotes?
 - A. RNA polymerase I B. RNA polymerase II
 - C. RNA polymerase III D. DNA polymerase
 - VII Which of the following correctly compares RNA polymerase in prokaryotes and eukaryotes?
 - A. Prokaryotes have three RNA polymerases, eukaryotes have one
 - B. Prokaryotes and eukaryotes both have only one RNA polymerase
 - C. Prokaryotes have one RNA polymerase, eukaryotes have three
 - D. Both have five RNA polymerases
 - VIII Which of the following is NOT a typical feature of a cloning vector?
 - A. Origin of replication B. Selectable marker
 - C. Promoter for host RNA polymerase D. Gene for antibiotic resistance
 - IX In blue-white screening, white colonies typically indicate:
 - A. No plasmid present B. Plasmid without insert
 - C. Plasmid with foreign DNA insert D. Dead bacterial cells
 - X Which enzyme is used in PCR to synthesize DNA?
 - A. DNA polymerase B. Taq polymerase
 - C. Ligase D. Reverse transcriptase
 - XI Which of the following is true about a cDNA library?
 - A. Contains introns and regulatory regions

- B. Made using mRNA as a template C. Represents the entire genome
D. Cannot be used to express eukaryotic proteins in bacteria
- XII** Which type of DNA sequence is commonly analyzed in DNA fingerprinting? A. Exons B. Introns
C. Short Tandem Repeats (STRs) D. Promoter regions
- XIII** The *trp* operon is best described as:
A. An inducible operon activated by tryptophan
B. A repressible operon inhibited by tryptophan
C. An inducible operon inhibited by tryptophan
D. A repressible operon activated by tryptophan
- XIV** Which of the following is essential for chain termination in Sanger sequencing? A. RNA primers B. DNA ligase C. dNTPs D. ddNTPs
- XV** What happens to the *lac* operon when lactose is absent?
A. The repressor binds to the operator, blocking transcription.
B. RNA polymerase binds and transcribes the genes.
C. Lactose directly binds to the promoter, activating the operon.
D. The operon remains continuously active.

2. Answer in long (any three) [10×3=30]

- I** Explain the process of DNA replication in prokaryotes, emphasizing the functions of key enzymes and detailing the synthesis of both the leading and lagging strands.
- II** Compare the regulation mechanisms, structural organization, and functional roles of the *lac* operon and *trp* operon in *E. coli*.
- III** Discuss the key differences between prokaryotic and eukaryotic transcription.
- IV** Explain the role of cloning vectors in genetic engineering and describe the methods used for the screening and molecular characterization of recombinant clones.

3. Answer in short (any six) [6×5=30]

- I** How does the presence of tryptophan affect the *trp* operon?
- II** Why is DNA polymerase III considered the main replicative enzyme in *E. coli*?
- III** What is the role of the TATA box in eukaryotic transcription initiation?
- IV** Name the enzyme responsible for synthesizing the RNA primer during DNA replication in *E. coli*.
- V** Why are plasmids useful tools in genetic engineering and molecular cloning?
- VI** How does the Shine-Dalgarno sequence aid in translation initiation in prokaryotes?
- VII** What happens to the *lac* operon when glucose is absent and lactose is present in *E. coli*?
- VIII** What is a silent mutation, and why does it not affect the resulting protein?

Printing Pages : 2

Paper Code: B080601T

A

(SVSU:2024-25/R)

Enrollment No.

Program Name: B.Sc. BT/BC/MB
 VI Semester / 3rd Year Examination
 Subject Code: B080601T
 Subject Name: Food Microbiology

[Time: 3 Hours]

[Max. Marks:75]

Note: 1. Attempt all the questions as per given instructions.

1. Multiple Choice Questions (MCQs)

[1×15=15]

- I Which of the following is an intrinsic factor affecting microbial growth in food?
 a) Temperature b) pH c) Storage conditions d) Relative humidity
- II Which microorganism is commonly used in yogurt production?
 a) *Escherichia coli* b) *Lactobacillus bulgaricus*
 c) *Clostridium botulinum* d) *Staphylococcus aureus*
- III Salmonella causes which type of foodborne illness?
 a) Intoxication b) Infection
 c) Toxin-mediated infection d) Allergic reaction
- IV Which of the following is a chemical food preservation method?
 a) Irradiation b) Freezing c) Drying d) Organic acids
- V FSSAI stands for:
 a) Food Safety Standards Association of India
 b) Food Sanitation Standards and Authority of India
 c) Food Safety and Standards Authority of India
 d) Food Surveillance System Authority of India
- VI Which of the following is a fecal indicator organism?
 a) *Bacillus subtilis* b) *E. coli* c) *Listeria* d) *Streptococcus*
- VII Which pathogen is associated with botulism?
 a) *Salmonella* b) *Clostridium botulinum*
 c) *Listeria monocytogenes* d) *Vibrio cholerae*
- VIII Which of the following is used in the fermentation of bread?
 a) *Saccharomyces cerevisiae* b) *Clostridium perfringens*
 c) *Aspergillus niger* d) *Penicillium roqueforti*
- IX Probiotics mainly help in:
 a) Enhancing color of food b) Food spoilage
 c) Gut health improvement d) Allergen production
- X Which of the following is NOT a physical method of food preservation?
 a) Irradiation b) Freezing c) Vacuum packing d) Organic acid addition
- XI Mycotoxins are produced by:
 a) Bacteria b) Yeasts c) Protozoa d) Fungi

- XII** The term “intoxication” in food microbiology refers to:
 a) Growth of pathogens in food b) Production of toxins in food
 c) Heating of food d) Presence of probiotics
- XIII** Which one is an extrinsic factor for microbial growth?
 a) Water activity b) Redox potential
 c) Temperature d) Nutrient content
- XIV** *Listeria monocytogenes* is dangerous particularly to:
 a) Children b) Healthy adults c) Pregnant women d) Athletes
- XV** Which process is governed by GMP?
 a) Fermentation b) Sterilization
 c) Safe manufacturing practices d) Microbial growth

2. Answer in long (any three) [10×3=30]

- I** Describe in detail the intrinsic and extrinsic factors affecting microbial growth in food.
- II** Explain the classification of foodborne pathogens and their diseases.
- III** Describe food preservation techniques with examples (physical, chemical, and biological).
- IV** What is HACCP? Explain its principles and application in food safety.

3. Answer in short (any five) [5×6=30]

- I** Discuss the industrial production of fermented foods.
- I** What are probiotics? Give one example
- II** What is fermentation and how is it useful in food
- III** What is the importance of pH in food preservation?
- IV** Mention two microbial spoilage signs in dairy products.
- V** Explain the scope and significance of food microbiology.
- VI** Explain the concept of functional foods with examples of added probiotics/prebiotics.
- VII** Elaborate on the role of microbes in the fermentation of dairy and bakery products.

19/05/2025

Printing Page: 2

Paper Code: MSC-BT-203

A

(SVSU:2024-25/R)

Enrollment No.

Program Name: M.Sc. (Biotechnology)

II Semester / 1st Year Examination

Subject Code: MSC BT 203

Subject Name: Plant Biotechnology

[Time: 3 Hours]

[Max. Marks:70]

Note: 1. Attempt all the questions as per given instructions.

2. Fill the correct answer of MCQs

1. Multiple Choice Questions (MCQs)

[1×15=15]

I The pair of hormones required for a callus to differentiate are_____.

- (a) Ethylene and Auxin (b) Auxin and cytokinin
(c) Auxin and Absciscic acid (d) Cytokinin and gibberellin

II Synthetic seeds are produced by the encapsulation of somatic embryos with_____.

- (a) Sodium acetate (b) Sodium nitrate
(c) Sodium chloride (d) Sodium alginate

III Haploid plants can be obtained from_____.

- (a) Anther culture (b) Bud culture (c) Leaf culture (d) Root culture

IV Which technique is used to introduce genes into dicots?

- (a) Electroporation (b) particle acceleration
(c) microinjection (d) Ti plasmid infection

V Virulence trait of *Agrobacterium tumefaciens* is borne on

- (a) chromosomal DNA (b) tumour inducing plasmid DNA
(c) both chromosomal and plasmid DNA (d) cryptic plasmid DNA

VI What compound(s) has been targeted for metabolic interference in tomatoes?

- (a) ACC (1-aminocyclopropane-1-carboxylic acid)
(b) SAM (S-adenosylmethionine)
(c) Both (a) and (b) (d) AOA (aminooxy acetic acid)

VII Name the first transgenic virus-resistant plant?

- (a) Rice (b) Cotton (c) Tobacco (d) Tomato

VIII Totipotency refers to_____.

- (a) Development of fruits from flowers in a culture
(b) Development of an organ from a cell in a culture medium
(c) Flowering in a culture medium
(d) All of the above

IX What is the green revolution related to?

- (a) Milk (b) Agriculture (c) Water (d) Animals

- X Name the technique which is used to enhance the life of a tomato.
 (a) Antisense technology (b) In vitro gene transfer
 (c) Ex vivo gene transfer (d) Molecular farming
- XI Tomatoes exhibiting delayed ripening express antisense RNA against _____
 (a) glycerol 1 phosphate acyl transferase (b) polygalactouranase
 (c) ACC deaminase (d) sucrose phosphate synthase gene
- XII GMO stands for _____
 (a) Genetically Matured Organisms (b) Genetically Mental Organs
 (c) Genetically Modified Organisms (d) Genetically Mutant Organism
- XIII A GM crop is _____
 (a) mature crop (b) infected crop
 (c) raised to green manure (d) transgenic crop
- XIV GM rice is enriched with vitamin _____
 (a) K (b) D (c) A (d) E
- XV Bt toxin is produced by a bacterium called _____
 (a) Bacillus thuringiensis (b) Bacillus anthracis
 (c) Bacillus thermophilus (d) Bacillus subtilis

2. Answer in long (any three) [10×3=30]

- I What are the different biosafety norms to release transgenics plant?
- II What do you understand by plant tissue culture? What are the different ways to produce haploid plants?
- III What are the genetically modified crops? Explain in detail about golden rice.
- IV Explain in detail agrobacterium mediated gene transfer.

3. Answer in short (any five) [5×5=25]

- I Write application of plant tissue culture in crop improvement.
- II Explain different direct methods of gene transfer.
- III What are the secondary metabolites? How they are produced?
- IV Write short note on hybrid seed production.
- V Differentiate between somaclonal and gametoclonal variation.
- VI How peptide bond formation takes place in proteins? Explain.
- VII Write short note on artificial seed?