MSC Biotechnology NOV 15

नक्षत्र - 001

Seat Number

* 1 7 6 8 *

BT - 301
Recombinant DNA Technology

P. Pages : 1

Time : Three Hours **Max. Marks : 80**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.

1. Attempt **any eight.** **16**

i) Ligases
ii) Cosmids
iii) Antisense RNA
iv) Transduction
v) HST
vi) C-DNA Probes.
vii) Expression in yeast
viii) Tagged proteins
ix) Connector

2. Explain. **16**

a) Liposome mediated gene transfer.
b) S_1 Nuclease.

OR

a) Calcium phosphate method.
b) Shuttle Vectors.

3. Attempt **any two.** **16**

a) Cells for cloning.
b) Nucleic acids probes.
c) Protein Engineering.

4. Attempt **any two.** **16**

a) Sanger's method.
b) Hazards & Impact of GE.
c) Expression of gene in insects.

5. Write short notes on **any three.** **16**

a) PUC18
b) DEAE
c) HAT
d) Gene Bank.
e) Adding tags and signals.

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Seat Number

* 1 7 6 9 *

BT - 401
Food and Pharmaceutical Biotechnology

P. Pages : 2

Time : Three Hours **Max. Marks : 80**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions are compulsory.
5. Figures to write indicates full marks.

1. Answer the following **any eight.** **16**

i) Inulin.

ii) Estrogen.

iii) DE_{50}.

iv) Probiotic.

v) GM-CSF.

vi) Progesterone.

vii) Vector.

viii) Hormone.

ix) Toxicity.

x) Endotoxin.

2. Attempt **any two.** **16**

i) Biotechnology of wine yeast.

ii) Causes of food spoilage.

iii) Food lows and standards related to Packaging.

3. Attempt **any two.** **16**

i) Good manufacturing practices.

ii) Biopharmaceuticals of animal origin.

iii) Recombinant thrombolytic agents.

4. Answer **any two.** **16**

i) Biotechnology of B-carotene.

ii) Clinical trial design.

iii) Growth hormone.

5. Write short note on **any four.** **16**

i) FDA.

ii) Chlorella.

iii) Pharmacokinetics.

iv) Pyrogen detection.

v) Coagulation factor.

vi) Food irradiation.

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Seat Number

* 2 0 1 8 *

BT - 201
Molecular Biology

P. Pages : 1

Time : Three Hours **Max. Marks : 80**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions carry equal marks.
5. All questions are compulsory.

1. Attempt **any eight.** **16**

i) Chaperon
ii) Inducer
iii) CpG island
iv) Okazaki fragment
v) Poly A Tail
vi) Psion
vii) Open reading frame
viii) Nonsense Mutation.
ix) Termination codon

2. Explain the types and mechanism of DNA damage. **16**

OR

Describe the post transcriptional modification.

3. Attempt **any two.** **16**

a) Nucleotide and polynucleotide.
b) Replication of linear DNA.
c) Enzymes for DNA manipulation.

4. Attempt **any two.** **16**

a) Aminoacyl tRNA synthetase.
b) Initiation factor and their regulation.
c) Lactose operon.

5. Write short notes on **any four.** **16**

a) Base excision repair.
b) DNA binding protein.
c) Chromatin.
d) RNA editing.
e) Gene expression in eukaryotes.

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Seat Number

नक्षत्र - 004

2019

BT - 101
Microbial Diversity and Physiology
(Old)

P. Pages : 2

Time : Three Hours **Max. Marks : 80**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions carry equal marks.
5. Draw a neat labelled diagram wherever necessary.

1. Answer in brief **any eight.** **16**

a) Explain the role of photosynthetic pigments in bacteria.

b) Write general character of algae.

c) Explain function of mesosome in bacteria.

d) What is Syntrophy.

e) Describe role of nitrogen fixing bacteria.

f) Define the term Rickettsia and Spirochetes.

g) What is significance of FISH assay.

h) Discuss briefly general characteristics of fungi.

i) Give function of flagella and pili in bacteria.

j) Explain how atmospheric microorganisms causes disease.

2. Answer the following **any two.** **16**

a) Describe the biosynthesis of bacterial cell wall and add note on significance of Gram character.

b) Explain various pure culture techniques in isolation of microorganisms.

c) How microorganisms are useful for production of primary and secondary metabolite in industry

3. Answer the following **any two.** **16**

a) Explain molecular analysis of bacterial community with suitable method.

b) Write a note on merits and demerits of culture dependent and culture independent method.

c) Explain briefly industrial application of microbes.

4. Answer the following **any two.** **16**

a) Discuss in brief use of microbes in production of Biogas and Biofertilizer.

b) Explain in detail pk pathway of microbes.

c) Write general character and classification of viruses.

5. Write short note on the following **any four.** **16**

a) Ribosomal RNA sequencing.

b) Hydrocarbon transformation.

c) Hyperthermophilic archaea.

d) Nutritional grouping of microorganisms.

e) Thermoplasma.

f) Microbes in terrestrial environment.

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Seat Number

* 2 0 2 0 *

BT - 302
Plant Biotechnology

P. Pages : 2

Time : Three Hours **Max. Marks : 80**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions carry equal marks.
5. Draw neat and labelled diagrams wherever necessary.

1. Explain **any eight.** **16**

i) Somatic embryo.

ii) Plant cell staining.

iii) Somaclonal variation.

iv) Antisense.

v) Transplastomic plants.

vi) Subprotoplasts.

vii) Reporter markers.

viii) Plantibodies.

ix) Micro satellites.

x) Vitrification.

2. Describe **any two.** **16**

i) Laboratory organization for plant tissue culture.

ii) Virus detection and elimination methods.

iii) Naploid production.

3. Explain **any two.** **16**

i) Transposon.

ii) Somatic hybridisation.

iii) Secondary metabolites.

4. Explain **any two.** **16**

i) Chloroplast genome organisation.

ii) Protoplast fusion techniques.

iii) Virus resistances transgenic plants.

5. Write short notes **any four.** **16**

i) Major applications of plant cell, tissue and organ culture.

ii) Protoplast isolation.

iii) Ti plasmid.

iv) Cytoplasmic male sterility.

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Seat Number

* 2 0 2 1 *

BT - 402
Bioinformatics

P. Pages : 2

Time : Three Hours **Max. Marks : 80**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions carry equal marks.
5. Draw neat labelled diagrams wherever necessary.

1. Answer in brief the following **any eight.** **16**

a) What is multiple sequence alignment?

b) What is Scop and CATH.

c) Enlist biological databases?

d) What is data Visualization?

e) Describe in brief Clustal.

f) What is SRS?

g) Enlist the program names used for gene predictions.

h) Define : Identity.

i) What is data mining?

j) What is Bioperl and biojava.

2. Answer **any two** of the following. **16**

a) Explain PAM and BLOSSUM.

b) Write note on Protein Data Bank.

c) Explain mass spectrometry with respect to MALDI-TOF.

3. Answer **any two** of the following. **16**

a) Write a note on ExPasy.

b) Explain methods of sequence alignment.

c) Give details of Gen Bank.

4. Attempt **any two** of the following. **16**

a) Explain protein structure Prediction.

b) Write in detail Swiss - PDB viewer.

c) Explain structure based homology modelling.

5. Write short note on **any four.** **16**

a) NCBI.

b) Modeller.

c) PIR.

d) FASTA.

e) DDBJ.

f) Online free web resources of bioinformatics.

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Seat Number

* 2 0 2 2 *

BT - 202

Bioinstrumentation and Biostatistics

P. Pages : 2

Time : Three Hours **Max. Marks : 80**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions are compulsory.
5. All questions carry equal marks.
6. Draw neat and labelled diagram wherever necessary.

1. Define **any eight.** **16**

i) Wall effect.

ii) Electrophoresis.

iii) Mode

iv) Standard deviation.

v) Frequency

vi) Phase shifting plate.

vii) Radioactivity

viii) Half life period.

ix) Sedimentation coefficient

x) Regression.

2. a) Calculate mean, median, mode of given data : 12

Variable	2	4	6	8	10	12	14	16	18	20
Frequency	15	20	25	27	30	20	15	21	10	11

OR

Data on Gram -ve bacteria is recorded in soil sample calculate standard deviation and coefficient of variation of the following data.

Gram –ve bacteria	7	8	9	10	11	12
No. of bacteria	13	13	18	17	15	14

b) Explain in brief density gradient centrifugation. 4

OR

Applications of ORD and CD.

3. Describe in detail **any two.** 16

i) Autoradiography and its applications.

ii) Affinity chromatography.

iii) Measures of central tendency.

4. Attempt **any two.** 16

i) Give principle, working and applications of phase contrast microscope.

ii) What is centrifugation, explain principle and types of centrifuge.

iii) Applications of x-ray diffraction and NMR.

5. Write short note on **any four.** 16

i) Test of significance and level of significance.

ii) Chi square test.

iii) Denaturing gel electrophoresis.

iv) Solid scintillation counter.

v) Principles of chromatography.

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Seat Number

नक्षत्र - 008

* 2 0 2 3 *

BT - 102

Biomolecules and Molecular Enzymology (Old)

P. Pages : 2

Time : Three Hours **Max. Marks : 80**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions are compulsory.
5. Draw neat and labelled diagram wherever necessary.

1. a) Answer the following **any four.** **8**

i) Km.

ii) Cofactor.

iii) Competitive inhibition.

iv) Immobilisation.

v) Linking number.

vi) Isomers.

b) Explain **any four.** **8**

i) Coenzyme.

ii) Enzyme activity.

iii) Feedback inhibition.

iv) Activation energy.

v) Hypoglycemia.

vi) Mutarotation.

2. Attempt **any two.** **16**

   i) Classification of lipids.

   ii) Secondary structure of proteins.

   iii) Methods of Immobilisation.

3. Attempt **any two.** **16**

   i) Ramachandran plot.

   ii) Glycolysis.

   iii) Industrial applications of Immobilised enzymes.

4. a) Explain in detail HMP shunt. **10**

   b) TPP in carbohydrate metabolism. **6**

5. Write short note on **any four.** **16**

   i) Cori cycle.

   ii) Ketone bodies.

   iii) Cis-trans isomerism.

   iv) Chargaff's rule.

   v) Isoenzymes.

   vi) Enzyme specificity.

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Seat Number

* 2 0 2 4 *

BT - 303
Advanced Environmental Biotechnology

P. Pages : 2

Time : Three Hours **Max. Marks : 80**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions are compulsory and carry equal marks.
5. Number to right indicate full marks.
6. Draw neat labelled diagram wherever necessary.

1. Define / Explain **any eight.** **16**

a) Biopesticide.

b) Bioaccumulation.

c) Metagen sensor.

d) Detoxification.

e) Bioavailability.

f) Threshold dose.

g) Biodiversity index.

h) Biosafety.

i) Biofuel.

2. Answer **any two.** **16**

a) Vermiculture and it's application in biotechnology.

b) Write in detail activated sludge process for waste water management.

c) Comment on evaluation of bioremediation.

3. Answer **any two.** **16**

a) Causes of biodiversity losses.

b) Define solid waste, enlist types & sources of solid waste.

c) Discuss environmental persistence & bioaccumulation.

4. Answer **any two.** **16**

a) Test for mutagenic & teratogenic agents.

b) Write in detail strategy for removal of SO_2.

c) Applications of biosensor in environmental monitoring.

5. Write short notes on **any four.** **16**

a) Extinct and endangered species.

b) Forensic toxicology.

c) Glucose biosensor.

d) Energy from biomass.

e) Anaerobic digestion.

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Seat Number

* 2 0 2 5 *

BT - 403
Industrial and Business Biotechnology

P. Pages : 2

Time : Three Hours **Max. Marks : 80**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions are compulsory.
5. Figures to right indicate full marks.

1. Define / explain **any eight** of following. **16**

i) Organic solvents.

ii) Management.

iii) Filtration.

iv) Dextran.

v) $VitB_{12}$.

vi) Importance of PHB.

vii) Antibiotics.

viii) Fermentation.

ix) Give example of lactic acid producing organism.

2. Write short notes on **any four** of following. **16**

i) Intellectual property rights.

ii) Penicillin acylase.

iii) Importance of entrepreneurship & self employment in India.

iv) General recovery method for vitamins.

v) Fermentation parameters for Riboflavin production.

3. Describe method of fermentative production & recovery of following **any two.** **16**

a) Acetone & Butanol.

b) Erythromycin.

c) Dextran & Alginate.

4. Write in detail **any two** of following. **16**

i) Production & applications of celluloses.

ii) Transformation of prostaglandins.

iii) Production & recovery of acetic acid.

5. a) Write general features of microbial polysaccharides & give suitable examples. **8**

OR

Write microorganisms involved, production & recovery of Glycerol.

b) Write production & applications of Glucose isomerase. **8**

OR

Write production process, recovery and applications of Tetracycline

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Seat Number

* 2 0 2 6 *

BT - 203

Bioprocess Engineering and Technology

P. Pages : 2

Time : Three Hours **Max. Marks : 80**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions are compulsory.
5. All questions carry equal marks.
6. Draw a neat labelled diagram wherever necessary.

1. Answer briefly **any eight.** **16**

a) Define Bioreactor.

b) Give the significance of Del factor.

c) Write note on centrifugation.

d) How protoplast fusion takes place in cell.

e) Write note on feedback inhibition.

f) Explain in brief cascade system.

g) Draw a neat labelled sketch of Impeller.

h) Write a note on two phase aqueous extraction.

i) Write significance of dilution rate in continuous culture.

j) Discuss briefly process of primary screening.

2. Answer the following. 12

a) Design a method of sterilization kinetics.

OR

a) How mutagenesis can lead to development of culture over producing primary metabolite.

b) Write significance of KLa. 4

OR

b) Write significance of filtration.

3. Answer the following **any two.** 16

a) Write a note on classification of fluid.

b) Describe kinetics of microbial growth and death.

c) Explain process of continuous sterilization.

4. Answer the following **any two.** 16

a) Describe the process for preservation of culture.

b) Write a note on cyclone reactor.

c) Explain safety consideration in down stream processing.

5. Write note on following **any four.** 16

a) Air sterilization.

b) Genetic engineering for strain improvement.

c) Cell disruption by chemical method.

d) Concept of "Reynolds number".

e) Secondary screening.

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Seat Number

* 2 0 2 7 *

BT - 103
Immunology (Old)

P. Pages : 2

Time : Three Hours **Max. Marks : 80**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Draw neat labelled diagrams wherever necessary.
5. All questions are compulsory.
6. All questions carry equal marks.

1. Explain the following briefly **any eight.** **16**

i) CD_8^+ Cell.

ii) MHC molecules.

iii) Antigenicity & immunogenicity.

iv) Lymphocyte homing.

v) IgE.

vi) FACS.

vii) Agglutination.

viii) APc.

ix) B cell.

x) Vaccine.

2. Explain the following **any two.** **16**

a) Explain erogenous & endogenous antigen presentation.

b) Explain classification of hypersensitivity reactions.

c) Explain RIA & its applications.

3. Explain the following **any two.** **16**

a) Explain structure & function of MHC I & II molecules.

b) Explain productions of recombinant vaccine with suitable example.

c) Explain activation of T & B cells.

4. Explain **any two** of the following. **16**

a) Primary & secondary immunodeficiency.

b) Explain classical pathway of complement activation.

c) Explain properties of cytokines.

5. Write notes on **any four.** **16**

a) IgG.

b) Factors affecting antigenicity.

c) Inflammation.

d) Immunoelectrophoresis.

e) Mechanism of autoimmunity.

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Seat Number

* 2 0 2 8 *

BT - 101
Microbial Diversity and Physiology
(243111)

P. Pages : 2

Time : Three Hours **Max. Marks : 60**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions are compulsory.
5. Figures to right indicate full marks.
6. Draw the neat labelled diagrams wherever necessary.

1. Attempt **any six** of the following. **12**

i) Green bacteria

ii) Methanogenesis

iii) Complex media

iv) Archaea

v) Pure culture

vi) Biogas

vii) Respiration

viii) FISH assay

2. Answer **any two** of the following. **12**

i) Explain chemical factors affecting microbial growth.

ii) Explain role of microorganisms in bioremediation.

iii) Explain biogeochemical cycling.

3. Answer **any two** of the following. **12**

i) Explain various mechanisms of nutrients transport in microorganisms.

ii) What is amphibolic pathway ? Explain with one example.

iii) Explain bacterial cell wall synthesis in detail

4. Explain **any two.** 12

i) Evolutionary chronometers & their significance.

ii) Explain ribotyping as a approach for bacterial classification.

iii) Study of microbial diversity using culture dependent methods.

5. Write notes on **any four.** 12

i) Denaturing Gradient Gel electrophoresis (DGGE)

ii) Growth curve.

iii) Pure culture technique.

iv) Staining techniques.

v) Biofertilizers.

vi) Anaplerotic reaction.

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Seat Number

* 2 0 2 9 *

BT - 102
Biomolecules and Molecular Enzymology
(243112)

P. Pages : 2

Time : Three Hours **Max. Marks : 60**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions are compulsory.
5. Figures to right indicates full marks.
6. Draw neat labelled diagrams whenever necessary.

1. Attempt **any six.** **12**

i) Coenzyme A

ii) Nucleotides.

iii) Peptide bond

iv) Active site

v) Activation energy

vi) Kcat

vii) Hill plot equation

viii) Specificity constant.

2. Answer **any two** of the following. **12**

i) Explain non-competitive mode of enzyme inhibition.

ii) Classification of lipids.

iii) Significance of LB plot.

3. Attempt **any two.** 12

i) Glycogen metabolism.

ii) Hydrolysis of proteins.

iii) Effect of substrate concentration of initial velocity.

4. Attempt **any two.** 12

i) Explain sequential mode of allosteric enzyme.

ii) Describe Brigg's Haldane hypothesis.

iii) Biosynthesis of triglycerides.

5. Write note on **any four** of the following. 12

i) Regulation of lipid metabolism.

ii) Structure elucidation of proteins.

iii) Carbohydrates.

iv) Nicotinamide.

v) Uncompetitive inhibition.

vi) Applications of enzyme in industries.

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Seat Number

* 2 0 3 0 *

BT - 103
Immunology (243113)

P. Pages : 2

Time : Three Hours **Max. Marks : 60**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions are compulsory.
5. Figures to right indicate full marks.
6. Draw the neat labelled diagrams wherever necessary.s

1. Attempt **any six.** **12**

i) B cell.

ii) TCR.

iii) Complement components.

iv) IgA

v) Autoimmunity.

vi) Agglutination

vii) Subunit vaccine

viii) Innate immunity.

2. Answer **any two** of the following. **12**

i) Explain structure & function of spleen.

ii) Explain antigen-antibody interactions.

iii) Explain activation of T_H cell.

3. Attempt **any two.** 12

i) Explain type II hypersensitivity reaction in detail.

ii) Explain primary immunodeficiency.

iii) Define inflammation explain causes of inflammation.

4. Attempt **any two** of the following. 12

i) Explain differences between precipitation & agglutination reactions.

ii) Explain ELISA test & its applications.

iii) Explain recombinant vaccine with suitable example.

5. Write notes on **any four** of the followings. 12

i) Adapter immune response.

ii) MHC I & II molecules.

iii) Immune - complex hypersensitivity.

iv) FACS.

v) Passive immunization.

vi) Autoimmunity mechanisms.

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