D 11662 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

General Biotechnology

GBT 3E 02—VIROLOGY—Part A

(2019 Admission onwards)

Time : Two Hours and a Half Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *The instruction if any, to attend a minimum number of questions from each sub section / sub part / sub division may be ignored.*
4. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Section A

Answer any **four** *questions.*
Each question carries a weightage of 2.

1. Name four DNA viruses.
2. What are prions ?
3. What is explant culture ?
4. What is peplomers ?
5. Name four non-enveloped viruses.
6. What is eclipse phase ?
7. What is interference ?

(4 × 2 = 8 weightage)

Section B

Answer any **four** *questions.*
Each question carries a weightage of 3.

Write briefly on :

8. Animal inoculation.
9. Inclusion bodies.

Turn over

10. Tissue culture.

11. Chorio Alantoic Membrane (CAM) inoculation.

12. Gamma interferons.

13. Latent viral infections.

14. Molecular methods used for virus detection.

(4 × 3 = 12 weightage)

Section C

Answer any **two** *questions.*
Each question carries a weightage of 5.

15. Explain the classification and mechanism of action of interferons.

16. Describe briefly about viral replication of RNA viruses.

17. Describe various methods used for the Detection of virus growth in cell culture.

18. Describe briefly on Viral assays.

(2 × 5 = 10 weightage)

D 11661 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

General Biotechnology

GBT 3E 01—STEM CELL BIOLOGY—Part A

(2019 Admission onwards)

Time : Two Hours and a Half Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *The instruction if any, to attend a minimum number of questions from each sub section / sub part / sub division may be ignored.*
4. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Part A

Answer any **four** *questions.*
Each question carries 2 *weightage.*

1. Mario R. Capecchi, Martin J. Evansand and Oliver Smithies.
2. Haematopoiesis.
3. Therapeutic cloning.
4. Neural stem cells.
5. Peripheral blood stem cells.
6. Autologous stem cells.
7. Surface markers.

(4 × 2 = 8 weightage)

Part B

Answer any **four** *questions.*
Each question carries 3 *weightage.*

8. iPSC.
9. CD antigens in Stem cells.

Turn over

10. UCSC and it's uses.
11. Routes of delivery of stem cells.
12. Safety challenges in Stem cell therapy.
13. Stem cells in wildlife conservation.
14. 3D scaffolds.

(4 × 3 = 12 weightage)

Part C

Answer any **two** *questions.*
Each question carries 5 *weightage.*

15. Legal perspectives of Stem cell research.
16. Discuss the role of stem cells in regenerative medicine.
17. Starting from a skin cell outline the production of a neuronal cell.
18. Uses of stem cell in drug discovery and toxicity studies.

(2 × 5 = 10 weightage)

D 11660 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

General Biotechnology

GBT 3C 04—IMMUNOLOGY

(2019 Admission onwards)

Time : Two Hours and a Half Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *The instruction if any, to attend a minimum number of questions from each sub section / sub part / sub division may be ignored.*
4. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Section A

Answer any **four** *questions.*
Each question carries a weightage of 2.

1. What are PAMPs ?
2. What are lymphoid progenitors ?
3. Define a conformational epitope.
4. Hemagglutination test.
5. Immunoproteasome.
6. STAT.
7. Antigen presenting cells.

(4 × 2 = 8 weightage)

Turn over

Section B

Answer any **four** *questions.*
Each question carries a weightage of 3.

8. Phage display library.
9. Adjuvant.
10. DNA vaccine.
11. HAT medium.
12. J-chain.
13. HLA typing.
14. IgG2.

(4 × 3 = 12 weightage)

Section C

Answer any **two** *questions.*
Each question carries a weightage of 5.

15. Describe the origin of diversity in a T cell receptor.
16. Describe how you perform RIA.
17. What is class switching of an antibody ? What are functions of the different classes ?
18. Describe a typical humoral response.

(2 × 5 = 10 weightage)

D 11659 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION NOVEMBER 2021

(CBCSS)

General Bio-technology

GBT 3C 03—PLANT BIOTECHNOLOGY

(2019 Admissions)

Time : Two Hours and a Half Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *The instruction if any, to attend a minimum number of questions from each sub section / sub part / sub division may be ignored.*
4. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Section A

Answer any **four** *questions.*
Each question carries 2 *weightage.*

1. Pollen culture.
2. pEG.
3. Auxin.
4. Browning.
5. Binary vector.
6. Cybrid.
7. SCAR markers.

(4 × 2 = 8 weightage)

Section B

Answer any **four** *questions.*
Each question carries a weightage of 3.

8. Ri plasmid.
9. RFLps.
10. Hardening.
11. Cryopreservation.
12. Chloroplast transformation.
13. Vectors of plant transformation.
14. Somatic hybrids.

(4 × 3 = 12 weightage)

Section C

Answer any **two** *questions.*
Each question carries a weightage of 5.

15. Explain the role of molecular markers in plant breeding.
16. Describe the process of synthetic seed production and its applications.
17. Describe the production of virus free plants.
18. Explain protoplast culture methods.

(2 × 5 = 10 weightage)

D 11658 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

General Biotechnology

GBT 3C 02—BIOPROCESS TECHNOLOGY

(2019 Admission onwards)

Time : Two Hours and a Half Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *The instruction if any, to attend a minimum number of questions from each sub section / sub part / sub division may be ignored.*
4. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Section A

Answer any **four** *questions.*
Each question carries a weightage of 2.

1. Define the power number.
2. What are spargers ?
3. Define bioconjugation.
4. What are secondary metabolites ?
5. Explain the term DDC.
6. Write note on laccase.
7. What is transduction ?

(4 × 2 = 8 weightage)

Section B

Answer any **four** *questions.*
Each question carries a weightage of 3.

8. Write note on fermentation media.
9. How site directed mutagenesis helps in strain improvement ?

Turn over

10. Write note on Bubble column reactors.

11. How chromatography helps in protein purification ?

12. Write note on microbial cellulase.

13. Why steam traps are used in a fermenter ?

14. Describe the Monod equation.

(4 × 3 = 12 weightage)

Section C

Answer any **two** *questions.*
Each question carries a weightage of 5.

15. Write an essay on the isolation and screening of industrially important microorganism.

16. Write the advantages and disadvantages of fed batch fermentation.

17. Write the steps involved in the industrial production of glutamic acid.

18. Explain the different methods of measuring the process variables in a fermenter.

(2 × 5 = 10 weightage)

D 11657 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

General Biotechnology

GBT 3C 01—GENETIC ENGINEERING

(2019 Admission onwards)

Time : Two Hours and a Half Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *The instruction if any, to attend a minimum number of questions from each sub section / sub part / sub division may be ignored.*
4. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Section A

Answer any **four** *questions.*

Each question carries a weightage of 2.

1. Write short note on 2um circle ?
2. What is AFLP analysis ?
3. What is autoradiography ?
4. What is a Patent ?
5. What is S1 mapping ?
6. Describe the term gene editing ?
7. What are artificial chromosomes ?

(4 × 2 = 8 weightage)

Section B

Answer any **four** *questions.*
Each question carries a weightage of 3

8. How a cDNA library is constructed ?
9. What are the applications of transgenic animals ?
10. What is FISH ?
11. Write note on Phagemids ?
12. What is gene therapy ?
13. What is host-controlled restriction modification system ?
14. What is a recombinant protein ?

(4 × 3 = 12 weightage)

Section C

Answer any **two** *questions.*
Each question carries a weightage of 5.

15. How a foreign gene can be incorporated in to an animal cell ?
16. Explain the DNA microarray technology ?
17. Write in detail about the different Biosafety levels ?
18. Describe about the baculovirus expression vector systems ?

(2 × 5 = 10 weightage)

D 11262 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER M.Sc. (BIOTECHNOLOGY) [NATIONAL STREAM] DEGREE EXAMINATION, DECEMBER 2021

(CCSS)

M.Sc. (Biotechnology)

BT 304 CC—GENOMICS AND PROTEOMICS

(2019 Admission onwards)

Time : Three Hours Maximum : 50 Marks

Part A

Answer any **one** *question in about* 600 *words.*
Each question carries 10 *marks.*

1. Explain the structure of chloroplasts.
2. Discuss on MALDI-TOF MS and its application in quantitative proteomics.

(1 × 10 = 10 marks)

Part B

Answer any **three** *of the following, each in about* 250 *words.*
Each question carries 5 *marks.*

3. Write on genome mapping.
4. Discuss on the strategies for whole genome sequencing.
5. What is comparative genomics ?
6. Write on protein expression profiling.
7. Write on biomedical applications of proteomics.

(3 × 5 = 15 marks)

Part C

Answer all **five** *questions, each in about* 100 *words.*
Each question carries 3 *marks.*

8. What is the clinical significance of plasmids ?
9. Write importance of 16S rRNA sequencing.
10. What is Next Generation Sequencing ?
11. Write the principle of multiple sequence alignment.
12. What is Yeast Two hybrid System ?

(5 × 3 = 15 marks)

Turn over

Part D

Write notes on each of the following in 50 *words.*
Each question carries 2 *marks.*

13. AFLP.
14. Pyro-sequencing.
15. DIGE analysis.
16. Reverse phase protein array.
17. Metagenomics.

(5 × 2 = 10 marks)

D 11261 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER M.Sc. (BIOTECHNOLOGY) [NATIONAL STREAM] DEGREE EXAMINATION, DECEMBER 2021

(CCSS)

M.Sc. (Biotechnology)

BT 30 3CC—GENETIC ENGINEERING

(2019 Admission onwards)

Time : Three Hours Maximum : 50 Marks

Part A

Answer any **one** *question in about* 600 *words.*
Each question carries 10 *mark.*

1. Describe the different kinds of PCR and their significance.
2. Explain the different types of microarrays and their applications.

(1 × 10 = 10 marks)

Part B

Answer any **three** *of the following, each in about* 250 *words.*
Each question carries 5 *marks.*

3. Klenow enzyme.
4. Recombinant screening.
5. Different types of Probes.
6. Crisper-Cas.
7. Gene silencing.

(3 × 5 = 15 marks)

Part C

Answer **all five** *questions, each in about* 100 *words.*
Each question carries 3 *marks.*

8. Mammalian expression vectors.
9. Automated sequencing.
10. Transfection.
11. Lambda vector.
12. Gene targetting.

(5 × 3 = 15 marks)

Turn over

Part D

Write notes on each of the following in 50 *words.*
Each question carries 2 *marks.*

13. Reporter assay.

14. Endonuclease.

15. Phage display.

16. Maxam & Gilbert method of sequencing.

17. DGGE

(5 × 2 = 10 marks)

D 11260 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER M.Sc. (BIOTECHNOLOGY) [NATIONAL STREAM] DEGREE EXAMINATION, DECEMBER 2021

(CCSS)

M.Sc. (Biotechnology)

BT 30 2CC—PLANT AND ANIMAL BIOTECHNOLOGY

(2019 Admission onwards)

Time : Three Hours Maximum : 50 Marks

Part A

Answer any **one** *question in about* 600 *words.*
Each question carries 10 *marks.*

1. Explain the different gene transfer methods in plants.
2. Describe the methods and conditions of viability for animal cell culture.

(1 × 10 = 10 marks)

Part B

Answer any **three** *of the following, each in about* 250 *words.*
Each question carries 5 *marks.*

3. Somaclonal variations and its application.
4. Describe the somatic embryogenesis pathway of regenereation.
5. Somatic hybridisation.
6. Animal vaccine production.
7. Animal cloning.

(3 × 5 = 15 marks)

Part C

Answer all **five** *questions, each in about* 100 *words.*
Each question carries 3 *marks.*

8. Slow growth method of germplasm conservation.
9. Human genome project.
10. Artificial insemination and embryo rescue in animals.
11. AFLP technique.
12. Marker assisted breeding.

(5 × 3 = 15 marks)

Turn over

Part D

Write notes on each of the following in 50 *words.*
Each question carries 2 *marks.*

13. Acclimatisation.
14. Vitrification.
15. STS.
16. BLAST.
17. DNA fingerprinting.

(5 × 2 = 10 marks)

D 11259 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER M.Sc. (BIOTECHNOLOGY) [NATIONAL STREAM] DEGREE EXAMINATION, DECEMBER 2021

(CCSS)

M.Sc. (Biotechnology)

BT 301 CC—BIO PROCESS ENGINEERING AND TECHNOLOGY

(2019 Admission onwards)

Time : Three Hours Maximum : 50 Marks

Part A

Answer any **one** *question in about* 600 *words.*
Each question carries 10 *marks.*

1. Discuss the methods of improvement of microbial strains for industrial uses.
2. Discuss the design and construction of bioreactors.

(1 × 10 = 10 marks)

Part B

Answer any **three** *of the following, each in about* 250 *words.*
Each question carries 5 *marks.*

3. Discuss the principles of media formulation for industrial fermentation.
4. Compare and analyze the economics of batch and continuous fermentation.
5. What are the various types of chromatographic techniques ?
6. What are the sugar conversion processes involved in food processing ?
7. Explain the role of fermentation in the production of food ingredients and additives.

(3 × 5 = 15 marks)

Part C

Answer all **five** *questions, each in about* 100 *words.*
Each question carries 3 *marks.*

8. How microbes can be screened for antibiotic production ?
9. How does chemostat work ?
10. How industrial fermentors are sterilized?
11. What are the applications of pectinases ?
12. How the medium in fermentor is agitated ?

(5 × 3 = 15 marks)

Turn over

Part D

Write notes on each of the following in 50 *words.*
Each question carries 2 *marks.*

13. Sauerkraut.
14. Biotransformation.
15. Fed-batch cultures.
16. Rotary vacuum-drum filter.
17. Biorefineries.

(5 × 2 = 10 marks)