C 22553 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER M.Sc. DEGREE [REGULAR/SUPPLEMENTARY] EXAMINATION, APRIL 2022

(CBCSS)

General Biotechnology

GBT 4E 06—NANOBIOTECHNOLOGY

(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 2 *weightage.*

1. Classify nanostructures according to their dimensions with examples.
2. Differentiate between cytotoxicity and biocompatibility. Are they related ? If yes, how ?
3. What are nanobots ? Briefly comment on their applications in Nanobiotechnology.
4. What are nano capsules ? Briefly point out their advantages in drug delivery into the body.
5. Give a brief note on biomolecular motors.
6. Give the applications of microvalves.
7. Briefly differentiate between passive tumor targeting and active tumor targeting.

(4 × 2 = 8 weightage)

Section B

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

8. Explain about Carbon Nanotubes (CNTs). Classify the types of Carbon Nanotubes and briefly mention about their applications.
9. Describe the process of Ball Milling Method.
10. Give a short note on Colloidal Nanostructures.
11. Explain the working principle of Transmission Electron Microscopy (TEM).
12. Enumerate the advantages of using DNA as building blocks for nanostructures.
13. Give a brief account on microneedles and their significance in drug delivery.
14. Elucidate about the criteria to select the nanostructures for biological applications.

(4 × 3 = 12 weightage)

Section C

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

15. Describe in detail about sol-gel processing and its various applications in nanotechnology.
16. Explain how Atomic Force Microscopy (AFM) can be used as a visualization and manipulation tool for nanostructures.
17. Explain how natural and artificial viruses could be used as nanocarriers in drug delivery.
18. Describe in detail about the role of Magnetic Nanoparticles as tools for biomedical applications.

(2 × 5 = 10 weightage)

C 22552 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER M.Sc. DEGREE [REGULAR/SUPPLEMENTARY] EXAMINATION, APRIL 2022

(CBCSS)

General Biotechnology

GBT4E05—INDUSTRIAL AND FOOD BIOTECHNOLOGY

(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 is Spray drying ?
2. What is Bioprocess engineering ?
3. Write note on Kimchi ?
4. Explain the term antifoams ?
5. Describe the term site directed mutagenesis ?
6. What is lactose intolerance ?
7. Explain the different physical methods of sterilization.

(4 × 2 = 8 weightage)

Section B

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

8. Write note on Food additives ?
9. How random mutagenesis helps in strain improvements ?
10. Describe Fed-batch fermentation technique.
11. Write note on microbial cellulase.
12. Explain the importance of inhibitors in fermentation media.
13. What are the uses of Lactobacillus in Bioprocess technology ?
14. What is fluidization ?

(4 × 3 = 12 weightage)

Section C

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

15. Write note on enzyme immobilization techniques.
16. Explain the different downstream processing.
17. What are recombinant enzymes ? Mention its applications in industry.
18. Write note on biosensors and its applications.

(2 × 5 = 10 weightage)

C 22550 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER M.Sc. DEGREE [REGULAR/SUPPLEMENTARY] EXAMINATION, APRIL 2022

(CBCSS)

General Biotechnology

GBT 4E 03—STEM CELL BIOLOGY—PART B

(2019 Admission onwards)

Time : Three Hours 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 is transdifferentiation ?
2. What are adult progenitor stem cells ?
3. What is SCNT ?
4. What is pluripotency ?
5. What is blatocyst ?
6. What is patient advocacy ?
7. What is germline gene therapy ?

(4 × 2 = 8 weightage)

Turn over

Section B

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

8. Comment on the role of institutional Bioethics committee.
9. Comment on the ethics of therapeutic cloning.
10. What is the procedure for preserving stem cells ?
11. Write a note on the cord blood banking for stem cell isolation.
12. Differentiate stem cell maturation and differentiation.
13. Comment on the role of adult stem cells in an adult organism.
14. What is the role of stem cell research in juvenile diabetes ?

(4 × 3 = 12 weightage)

Section C

Discuss in detail about any **two** *questions.*
Each question carries a weightage of 5.

15. What is the application of stem cell research in neurodegenerative diseases ?
16. What are the applications of stem cells in medicine and therapeutics ?
17. What are the methods for harvesting and characterizing mouse ES cells ?
18. Give a brief overview of FDA regulation in stem cell research.

(2 × 5 = 10 weightage)