

**THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)  
EXAMINATION, NOVEMBER 2022**

(CBCSS)

General Biotechnology

GBT 3E 01—STEM CELL BIOLOGY—Part A (Option I)

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

**Section A**

*Answer any **four** questions.*

*Each question carries a weightage of 2.*

1. What are primordial germ cells ?
2. What is Metaplasia ?
3. What is stem cell maturation ?
4. What is tissue regeneration ?
5. What are hematopoietic stem cells ?
6. Define Sternness.
7. What is a gastrula ?

(4 × 2 = 8 weightage)

**Section B**

*Answer any **four** questions.*

*Each question carries a weightage of 3.*

8. Comment on stem cell criteria ?
9. What are the characteristics of stem cells ?
10. Differentiate adult and embryonic stem cells ?
11. Write a note on cord blood stem cell harvesting ?

**Turn over**

12. What is stem cell differentiation ? Comment on neural stem cell differentiation?
13. What are the sources of adult stem cells ? What are their role in an adult organisms ?
14. Comment on tumour stem cells and their role in cancer prognosis ?

(4 × 3 = 12 weightage)

### Section C

*Discuss in detail about any **two** questions.*

*Each question carries a weightage of 5.*

15. What is the principle and procedure of somatic cell nuclear transfer for mammalian cloning ?
16. What are the applications of stem cells ?
17. Write a note on neural cell differentiation ? What is neural differentiation by default ?
18. Write in detail about the preservation of stem cells. What is cord blood banking ? What is amniotic fluid stem cell harvesting ?

(2 × 5 = 10 weightage)

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General Biotechnology  
GBT 3C 04—IMMUNOLOGY  
(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

Section A

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

1. PRR.
2. Complement receptor.
3. Hashimoto's thyroiditis.
4. Autocrine signaling.
5. Mast cells.
6. CD28-B7.
7. Bcl-2 family.

(4 × 2 = 8 weightage)

Section B

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

8. Radial immunodiffusion.
9. Hybridoma.
10. Immunogen vs. Antigen.
11. Antigen binding site of an antibody.
12. Immunity against tapeworm.

13. NK cells.
14. Germinal center.

(4 × 3 = 12 weightage)

### Section C

*Answer any two questions.*

*Each question carries a weightage of 5.*

15. Describe the diversity of an antibody.
16. Describe the three pathways of complement. What are the host's preventive mechanisms ?
17. Describe a typical cytotoxic response.
18. What are the cancers of the immune system ?

(2 × 5 = 10 weightage)

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(CBCSS)

General Biotechnology

GBT 3C 03—PLANT BIOTECHNOLOGY

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

**Section A**

*Answer any four questions.*

*Each question carries a weightage of 2.*

1. Comment on embryo rescue.
2. What is somaclonal variation ?
3. Give an account on Macronutrients.
4. What are single cell cultures ?
5. Undefined medium.
6. Somatic hybrid.
7. Ti plasmid.

(4 × 2 = 8 weightage)

**Section B**

*Answer any four questions.*

*Each question carries a weightage of 3.*

8. Micropropagation.
9. Somatic embryogenesis.
10. Anther culture.
11. Biolistics.
12. Slow growth germplasm conservation.

**Turn over**

13. Use of transgenic plants as bioreactors.
14. Map based gene cloning.

(4 × 3 = 12 weightage)

### Section C

*Answer any two questions.*

*Each question carries a weightage of 5.*

15. Compare the direct and indirect pathways of plant regeneration.
16. Describe the merits of Agrobacterium based transformation.
17. Molecular markers and their role in plant breeding.
18. Tissue culture media composition.

(2 × 5 = 10 weightage)

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(CBCSS)

General Biotechnology

GBT 3C 02—BIOPROCESS TECHNOLOGY

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

**Section A**

*Answer any four questions.*

*Each question carries a weightage of 2.*

1. What are biopesticides ?
2. Explain the term GRAS.
3. Define Reynolds number.
4. What is Data logging ?
5. Write note on microbial lipase.
6. What is crude media ?
7. Explain the term Exponential phase.

(4 × 2 = 8 weightage)

**Section B**

*Answer any four questions.*

*Each question carries a weightage of 3.*

8. Describe the term 'Scale-up of fermentation'.
9. What is Head space volume ?
10. How random mutagenesis helps in strain improvement ?
11. Explain Photobioreactors.
12. Describe the different cell disruption methods.

13. What are the minor components of a fermentation media ?
14. Write note on microbial metabolites.

(4 × 3 = 12 weightage)

### Section C

*Answer any two questions.*

*Each question carries a weightage of 5.*

15. Write in detail about the industrial production of ethanol.
16. Explain the design of a fermenter with its important parts.
17. Write the advantages and disadvantages of continuous fermentation.
18. Write short note on the anti-cancer agents from micro-organisms.

(2 × 5 = 10 weightage)

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(CBCSS)

General Biotechnology

GBT 3C 01—GENETIC ENGINEERING

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

**Section A**

*Answer any four questions.*

*Each question carries a weightage of 2.*

1. What is a phage display system ?
2. What is electroporation ?
3. Write short note on nucleases.
4. Describe the term GMOs.
5. What are edible vaccines ?
6. What is DNA transfection ?
7. Explain the term gene augmentation therapy.

(4 × 2 = 8 weightage)

**Section B**

*Answer any four questions.*

*Each question carries a weightage of 3.*

8. What is a dot blot ?
9. Explain BAC.
10. Explain about M-13 phage-based vectors.
11. What is a Knock-out mouse ?
12. What is Pedigree analysis ?

**Turn over**

13. Describe the antibody-based screening methods for recombinant proteins.
14. Write down the essential criteria for getting a patent.

(4 × 3 = 12 weightage)

### Section C

*Answer any two questions.*

*Each question carries a weightage of 5.*

15. Explain the Southern blotting technique.
16. Differentiate between cDNA libraries and genomic libraries.
17. Describe the term molecular diagnosis ?
18. Explain the hazards of environmental engineering.

(2 × 5 = 10 weightage)

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