

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

(CBCSS)

Botany

BOT 3C 09—BIOTECHNOLOGY AND BIOINFORMATICS

(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.*

**Part A**

I. Write short notes on any *four* questions (Each answer not to exceed 5 sentences) :

- 1 What is bioreactor ? Name different types of bioreactors used in plant cell culture.
- 2 Define organogenesis. Add a note on direct and indirect organogenesis.
- 3 What is FISH ? Write applications of FISH.
- 4 Write principle of antisense RNA technology.
- 5 What is Open Archive Initiative ?
- 6 What is comparative genomics ?
- 7 What is BLAST and CLUSTAL-W ?

(4 × 2 = 8 weightage)

II. Answer any *four* of the following (Each answer not exceed 250 words) :

- 8 Define somaclonal variation. What is its significance ?
- 9 Give a comparative account on RAPD and RFLP.
- 10 What are cloning vectors ? Give an example. Add a note on different components of a vector.
- 11 Give a brief account on Human genome project.
- 12 Explain biosafety protocols of recDNA research lab.
- 13 What is Rasmol, TrEMBOL, and CATH ?
- 14 Explain different approaches to EST analysis.

(4 × 3 = 12 weightage)

III. Answer any *two* questions. (Each answer not to exceed 500 words) :

- 15 Discuss principle, techniques and applications of plant tissue culture.
- 16 What is recombinant DNA technology ? Elaborate on various steps involved in recombinant DNA technology.
- 17 Discuss current status and achievements of transgenic research in plants.
- 18 Give an account on multiple alignment technique.

(2 × 5 = 10 weightage)

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Botany

BOT 3C 08—ANGIOSPERM MORPHOLOGY, ANGIOSPERM TAXONOMY AND PLANT  
RESOURCES

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

**General Instructions**

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I. Answer any *four* questions :

- 1 Distinguish between homology and analogy
- 2 What are the salient features of ICBN ?
- 3 What is phylocode ?
- 4 What is CAL ? What is its significance ?
- 5 Write a note on artificial system of classification.
- 6 Correct the botanical name given below if any mistake :  
*V. Trifolia Var simplicifolia Cham.*
- 7 What do you mean by axile placentation ? Name a species having axile placentation.

(4 × 2 = 8 weightage)

II. Write short essay on any *four* questions :

- 8 Give an account on chemotaxonomy.
- 9 Describe the origin and evolution of stamens in angiosperms.
- 10 What is the significance of biosystematics ?

**Turn over**

- 11 Describe the scope and importance of molecular taxonomy.
- 12 Describe the concept of foliar origin of carpels.
- 13 What is typification? Distinguish between holotype and isotype.
- 14 What are the conditions required for valid publication?

(4 × 3 = 12 weightage)

III. Write an essay on any *two* of the following :

- 15 Briefly explain the role of floral anatomy in suggesting the origin and evolution of flower.
- 16 Describe the significance of Botanic garden in taxonomy by citing examples at the National level.
- 17 Write down the procedure for Herbarium preparation.
- 18 Write an account on DNA barcoding in plants and its advantages.

(2 × 5 = 10 weightage)

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Botany

**BOT 3C 07—PLANT PHYSIOLOGY, METABOLISM AND BIOCHEMISTRY**

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

**General Instructions**

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2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
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**Part A**

I. Write short notes on any *four* questions. Each answer not to exceed *five sentences* :

- 1 What is symbiotic nitrogen fixation ?
- 2 What is absorption and action spectra ?
- 3 What are different types of enzyme inhibitors ?
- 4 What are major fate of pyruvic acid ?
- 5 Define amphibolic pathways and anapleurotic reactions.
- 6 Explain supramolecular architecture of membranes.
- 7 Define secondary metabolites. What are ecological significances of secondary metabolites ?

(4 × 2 = 8 weightage)

**Turn over**

**Part B**

II. Answer any *four* of the following. Each answer not exceed 250 words :

- 8 Explain the ascent of xylem water and uptake of water by roots.
- 9 Illustrate C3 cycle.
- 10 List important physiological functions of cytokinins.
- 11 Give an account on phloem transport.
- 12 Explain classes of enzyme. Give examples.
- 13 Outline tricarboxylic acid cycle.
- 14 Explain structure and synthesis of triacylglycerol.

(4 × 3 = 12 weightage)

**Part C**

III. Answer any *two* questions. Each answer not to exceed 500 words :

- 15 Give an elaborate account on plant response to various stresses.
- 16 Illustrate electron transport chain and synthesis of ATP.
- 17 Explain biological nitrogen fixation. Add a note on genetics of nitrogen fixation.
- 18 Give an account on classification of lipids. Explain structural and functional features of lipids.

(2 × 5 = 10 weightage)