

**THIRD SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2020**

(CCSS)

M.Sc. Applied Plant Science

BOT 3C 23—GENETIC ENGINEERING AND BIOINFORMATICS

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

**Part A***Answer any two questions.**Each answer should not exceed 500 words.*

1. Write an essay on applications of transgenic techniques.
2. Briefly explain the scope and applications of *insilico* modelling and drug design.
3. Explain the artificial methods of gene transfer techniques in prokaryotes and eukaryotes.

(2 × 10 = 20 marks)

**Part B***Answer any eight questions.**Each answer should not exceed 250 words.*

4. Discuss the ethical and legal issues related with GMOs.
5. Write an account on structural databases.
6. Describe terminator gene technology.
7. Write a comparative account on genomic library and cDNA library.
8. What is comparative genomics ? Describe the tools for analysis.
9. Explain PCR and its variants.
10. What are vectors in genetic engineering ? Explain various types.
11. Describe genetic engineering for metabolic engineering.
12. Explain molecular visualization tools with examples.
13. What are primers ? Write an account on primer designing tools.

(8 × 5 = 40 marks)

**Turn over**

**Part C**

*Answer any ten questions.*

*Each answer should not exceed five sentences.*

14. Protein sequencing.
15. Human genome project.
16. RFLP.
17. Colony hybridization.
18. Blue white colony selection.
19. Chromosome walking.
20. Designer enzymes.
21. PHYLIP.
22. Biohazards.
23. Homozygous cultivars.
24. Antisense technology.
25. Organelle engineering.

(10 × 2 = 20 marks)

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BOT 3C 21—CELL AND MOLECULAR BIOLOGY

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

**Part A***Answer any two questions.**Each answer should not exceed 500 words.**Each question carries 10 marks.*

1. Define Mutation. Give a detailed account on the different types and its causes. How it is repaired in a cell ?
2. What are plastids ? Write an account of the structure and functions of different types of plastids.
3. Explain in detail, the mechanism and enzymology of DNA replication *in vivo*.

(2 × 10 = 20 marks)

**Part B***Answer any eight questions.**Each answer should not exceed 250 words.**Each question carries 5 marks.*

4. What are Cell junctions ? Give a brief account of its ultrastructure.
5. What are the components of GERL complex ? Add a note on its function.
6. What are microbodies ? Write a brief account on its structure and function.
7. What are histone proteins ? Give a detailed account on its structure and role.
8. Write a short essay on motor proteins. Give examples.
9. What are the structural features of different forms of DNA? Explain.
10. Write an account on the major steps involved in RNA processing.
11. Briefly explain the role of small RNA molecules in gene regulation.
12. Write a short account on the DNA repair mechanisms and repair deficiency disorders.
13. What are chaperones and chaperonins ? Briefly explain their roles.

(8 × 5 = 40 marks)

**Turn over**

**Part C**

*Answer any ten questions.*

*Each answer should not exceed 5 sentences.*

*Each question carries 2 marks.*

14. Cre-Lox recombination system.
15. SOS repair mechanism.
16. Induced mutations.
17. Microtubules.
18. Nucleosome.
19. Dynein and dynactin.
20. Glyoxysomes.
21. Role of Microvesicles.
22. Structure of Phycobilisomes.
23. Trans-splicing.
24. Cajal body.
25. B-chromosomes.

(10 × 2 = 20 marks)

**THIRD SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2020**

(CCSS)

M.Sc. Applied Plant Science

BOT 3C 19—GENETICS, PLANT BREEDING AND BIostatISTICS

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

**Part A**I. Answer any *two* of the following. Each answer not exceeding 500 words :

- 1 Give an account on the genetics of nitrogen fixation and photosynthesis.
- 2 Explain modern methods of plant breeding and their role in agriculture.
- 3 Describe graphical representation of numerical data.

(2 × 10 = 20 marks)

**Part B**II. Answer any *eight* of the following. Each answer not exceeding 250 words :

- 4 Describe systems of reproduction in plants.
- 5 Explain linkage of sex in inheritance of characters.
- 6 Explain the genetic organization of viruses.
- 7 Explain cytoplasmic inheritance.
- 8 Comment on the importance of germplasm conservation and documentation in plant breeding.
- 9 Write a note on the major objectives of plant breeding.
- 10 Explain various methods of plant propagation.
- 11 Give an account on tests of significance.
- 12 Comment on the merits and demerits of primary and secondary data.
- 13 Measures of central tendencies.

(8 × 5 = 40 marks)

**Turn over**

**Part C**

III. Answer any *ten* of the following. Each answers not exceeding 100 words :

- 14 Speciation.
- 15 Euphenics.
- 16 Multiple allelism.
- 17 Sewall Wright effect.
- 18 Mitochondrial genes.
- 19 Transgressive variation.
- 20 Acclimatization.
- 21 Breeding composite varieties.
- 22 Quarantine.
- 23 Standard error.
- 24 Transduction
- 25 Factor analysis.

(10 × 2 = 20 marks)

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(CCSS)

M.Sc. Plant Science

BOT 3C 17—ANGIOSPERM TAXONOMY AND PHYTOGEOGRAPHY

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

**Part A**I. Answer any *two* of the following. Each answer not exceeding 500 words :

- 1 Describe the methods in preparing herbarium specimens. Add a note on the significance of herbarium.
- 2 Give a broad outline of APG system of classification. Compare this with Bentham and Hooker system.
- 3 Discuss various types of plant distribution and related theories.

(2 × 10 = 20 marks)

**Part B**II. Answer any *eight* of the following. Each answer not exceeding 250 words :

- 4 Taxonomic hierarchy.
- 5 Typification.
- 6 Various concepts of species.
- 7 Centers of origin.
- 8 Palynology in taxonomy.
- 9 Indented and Bracketed keys.
- 10 Cladogram.
- 11 Botanical survey of India.
- 12 Floristic regions of the world.
- 13 Rule of priority and its limitations.

(8 × 5 = 40 marks)

**Turn over**

**Part C**

III. Answer any *ten* of the following. Each answer not exceeding 100 words :

- 14 Parellelism and convergence.
- 15 DNA barcoding.
- 16 Author citation.
- 17 Homology and analogy.
- 18 Monographs.
- 19 Age and area hypothesis.
- 20 Manuals and periodicals.
- 21 Endemism.
- 22 Naming of cultivars.
- 23 Bayesian analysis.
- 24 Nomina conservanda.
- 25 Numerical taxonomy.

(10 × 2 = 20 marks)