

C 83023

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Name.....

Reg. No.....

SECOND SEMESTER M.A./M.Sc./M.Com. DEGREE EXAMINATION  
JUNE 2020

(CBCSS)

Botany

BOT 2C 04—CELL BIOLOGY, MOLECULAR BIOLOGY AND BIOPHYSICS

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

**Part A**

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

1. Write notes on chromosome banding and its significance.
2. Give an account of any *two* meiotic defects and human diseases.
3. Make a comparison of different forms of DNA.
4. Write an account of the proteins involved in prokaryotic DNA replication.
5. Explain the role of telomerase in DNA replication.
6. Write notes on the basic principles and application of paper chromatography and TLC.
7. Explain the principle and applications of centrifugation.

(4 × 2 = 8 weightage)

**Part B**

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

8. Write about the proteins regulating apoptosis and the pathways leading to cell death.
9. Write a detailed account on genetic basis of malignant transformation, with emphasis on oncogenes and tumour suppressor genes.
10. Give a detailed structure of nuclear pore. How do the nuclear proteins are imported and exported through the pore complex ?

**Turn over**

11. Describe the different known mechanisms of RNA splicing for :
- (a) Group I and group II introns.
  - (b) Yeast tRNAs and
  - (c) Eukaryotic hn RNA
12. Explain *lac* operon. Discuss the mechanism of cyclic AMP mediated positive control system in glucose sensitive operon like *lac* operon.
13. Discuss in detail, the post translational modifications of proteins.
14. What are unique and repetitive sequences of DNA? Discuss the possible functions of repetitive sequence and explain why they have not been eliminated due to natural selection.

(4 × 3 = 12 weightage)

### Part C

Answer any **two** questions.

Each question carries 5 weightage.

15. Cell cycle check points can prevent the propagation of mutations into the next cell generation and thereby preserve the fidelity of the genome. Justify the statement.
16. Write a detailed account on communication, recognition and adhesion in cell to cell interaction during the development of a multicellular organism.
17. Write an essay on physical and chemical mutagens and the molecular mechanism of mutation.
18. Give a detailed account on the principle, working and applications of PAGE and agarose gel electrophoresis.

(2 × 5 = 10 weightage)