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R – 7489

Reg. No. :

Name :

Second Semester M.Sc. Degree Examination, November 2023

Botany

BO 223 : CELL BIOLOGY, GENETICS AND EVOLUTION

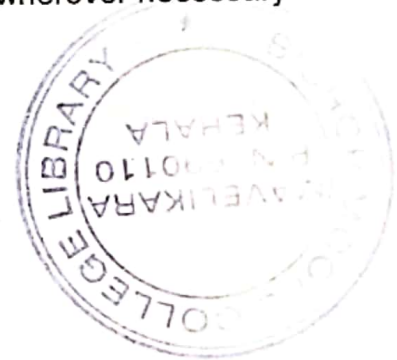
(2019 Admission Onwards)

Time : 3 Hours

Max. Marks : 75

Instruction: Draw diagrams and illustrate with examples wherever necessary

- I. Answer the following questions :
 1. Explain proto-oncogenes.
 2. What is a pseudoallele?
 3. Compare complete and partial linkage.
 4. What do you mean by consanguinity?
 5. Describe the types of isolating mechanisms.
 6. What do you mean by a Mendelian population?
 7. Describe housekeeping genes.
 8. What is gene amplification?
 9. Describe genetic imprinting.
 10. What are cohesion rings?



(10 × 1 = 10 Marks)

P.T.O.



II. Answer the following questions in not more than 50 words.

11. (a) Describe plant and animal stem cells.

OR

(b) Explain Bateson's concept of coupling and repulsion.

12. (a) Describe exceptional codon meanings.

OR

(b) Give an account on the mechanism of speciation in evolution.

13. (a) Describe split genes.

OR

(b) Describe the steps for solving pedigree analysis.

14. (a) Write short notes on nuclear pore complex.

OR

(b) Give a short account on a major type of metabolic error in man.

15. (a) Describe environmental regulation of gene expression.

OR

(b) What is the difference between genetic drift and mutation?

(5 × 2 = 10 Marks)

III. Answer the following questions in not more than 150 words.

16. (a) Compare mitochondrial and chloroplast genome organisation.

OR

(b) Describe the mechanism of apoptosis.

17. (a) Explain sex-chromosome dosage compensation.

OR

(b) Give an account of complementation tests.

18. (a) Compare the genetic control of development in plants and animals.

OR

(b) Comment on different types of speciation.

19. (a) Write notes on cytoskeletal structures in eukaryotic cells.

OR

(b) Distinguish between the mechanism of translation in prokaryotes and eukaryotes.

20. (a) Give an account on site directed mutagenesis.

OR

(b) Explain the role of cyclin and cyclin dependent kinases in cell cycle.

21. (a) Give an account on Khorana's experiments for the artificial synthesis of gene.

OR

(b) Describe genetic diseases caused by defects in DNA repair systems.

22. (a) Explain the Hardy-Weinberg law and its applications.

OR

(b) Compare the structure of B-DNA and Z-DNA.

(7 × 5 = 35 Marks)



IV. Answer the following questions in not more than 250 words.

23. (a) Give an account on numerical chromosome variants. Add notes on their meiotic behaviour.

OR

- (b) Compare the events and enzymes involved in prokaryotic and eukaryotic DNA replication.

24. (a) Describe the structure and functions of cell junction complexes found on cell membrane.

OR

- (b) What is operon concept? Explain the different types of operons prevalent in prokaryotes.

(2 × 10 = 20 Marks)

