

Bachelor's Degree Programme in Science

**Elective Course
in
Genetics**

(Valid from 1st January 2021 to 31st December, 2021)

**It is compulsory to submit the Assignment before filling
the Term-End examination Form**

Please Note

- **You can take electives (56 to 64 credits) from a minimum of TWO and a maximum of FOUR science disciplines, viz. Physics, Chemistry, Life Sciences and Mathematics.**
- **You can opt for elective courses worth a MINIMUM OF 8 CREDITS and a MAXIMUM OF 48 CREDITS from any of these four disciplines.**
- **At least 25% of the total credits that you register for in the elective courses from Life Sciences, Chemistry and Physics disciplines must be from the laboratory courses. For example, if you opt for a total of 64 credits of electives in these 3 disciplines, at least 16 credits should be from lab courses.**
- **You cannot appear in the Term-End Examination of any course without registering for the course. Otherwise, your result will not be declared and the onus will be on you.**



**School of Sciences
Indira Gandhi National Open University
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New Delhi-110068**

(2021)

Dear Student,

We hope you are familiar with the system of evaluation to be followed for the Bachelor's Degree Programme. At this stage you may probably like to re-read the section on assignments for Elective Courses in the Programme Guide that we have sent you after your enrolment. A weightage of 30 per cent, as you are aware, has been earmarked for continuous evaluation which would consist of **one tutor-marked assignment (TMA)** for this course.

Instructions for Formatting Your Assignments

Before attempting the assignment please read the following instructions carefully.

- 1) On top of the first page of your TMA answer sheet, please write the details exactly in the following format:

ENROLMENT NO.:

NAME :

ADDRESS

.....

COURSE CODE :

COURSE TITLE :

ASSIGNMENT NO.:

STUDY CENTRE : DATE:

PLEASE FOLLOW THE ABOVE FORMAT STRICTLY TO FACILITATE EVALUATION AND TO AVOID DELAY.

- 2) Use only foolscap size writing paper (but not of very thin variety) for writing your answers.
- 3) Leave 4 cm margin on the left, top and bottom of your answer sheet.
- 4) Your answers should be precise.
- 5) While solving problems, clearly indicate the question number along with the part being solved. Be precise.
- 6) **This assignment will remain valid for one year from January 1, 2021 to December 31, 2021.** However, you are advised to submit it within **12 weeks** of receiving this booklet to accomplish its purpose as a teaching-tool. Answer sheets received after the due date shall not be accepted.
- 7) **You cannot fill the exam form for this course until you have submitted this assignment.**

We strongly feel that you should retain a copy of your assignment response to avoid any unforeseen situation and append, if possible, a photocopy of this booklet with your response.

We wish you good luck!

ASSIGNMENT
(Tutor Marked Assignment)
Genetics

Course Code: LSE-03
Assignment Code: LSE-03/TMA/2021

Maximum Marks: 100

1. With a suitable cross describe Mendel's Law of Independent Assortment. (10)
2. Briefly explain *five* types of chromosomal sex determination mechanisms citing one example of each. (10)
3. Distinguish between: (10)
 - i) Dominant and Recessive Epistasis.
 - ii) Complete and Incomplete Linkage.
4. With the help of clear and labelled diagrams describe the *four* types of structural abnormalities that occur in chromosomes. (10)
5. What is polyploidy? Make a distinction between autopolyploidy and allopolyploidy. Explain their role in plant breeding by giving suitable examples. (10)
6. Elucidate the different control points of gene expression in organisms. Discuss most prevalent mode of control of gene expression in prokaryotes. (10)
7. Mention any two examples of oncogenic viruses. Make a flow-chart to show the steps involved in cellular transformation by a RNA tumor virus. (10)
8. How is the *Ti* plasmid of *Agrobacterium tumefaciens* used in plant genetic engineering? Explain the process in detail. (10)
9. State the Hardy-Weinberg Law and discuss the conditions under which this is applicable. (10)
10. What is genetic counselling? How is the parental diagnosis of genetic disorders helpful in the improvement of human health? (10)