STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086
(For candidates admitted during the academic year 2023 – 2024)

B. Sc. DEGREE EXAMINATION, APRIL 2026
BRANCH V (a) – PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SIXTH SEMESTER

COURSE : MAJOR – CORE
PAPER : GENETICS, PLANT BREEDING AND EVOLUTION
SUBJECT CODE : 23BT/MC/GP64
TIME : 3 HOURS MAX. MARKS: 100

Q. No.	SECTION A CHOOSE THE CORRECT ANSWER (5 X 1 =5)	CO	KL
1.	Multiple gene inheritance is also called _____. a) Mendelian inheritance b) Cytoplasmic inheritance c) Sex-linked inheritance d) Polygenic inheritance	1	1
2.	The term 'Linkage' was first described by _____. a) Mendel b) Morgan c) Darwin d) Watson	1	1
3.	Exchange of segments between non-homologous chromosomes is _____. a) Inversion b) Duplication c) Translocation d) Deletion	1	1
4.	The process of removing anthers before they dehisce is called _____. a) Emasculation b) Tagging c) Bagging d) Selfing	1	1
5.	Speciation occurs due to _____. a) Gene flow b) Isolation c) Random mating d) Equilibrium	1	1
	FILL IN THE BLANKS. (5 X 1 =5)	**CO**	**KL**
6.	Complementary gene interaction produces _____ratio in F_2 generation.	1	1
7.	The unit of genetic distance is _____.	1	1
8.	An example for man made cereal is _____.	1	1
9.	Polyploidy can be induced by the application of _____.	1	1
10.	The theory of Natural selection was proposed by _____.	1	1
	STATE WHETHER TRUE OR FALSE. (5 X 1 = 5)	**CO**	**KL**
11.	A cross involving two pair of contrasting traits is called monohybrid cross.	1	1
12.	Crossing over takes place during pachytene stage of Meiosis I.	1	1
13.	Hardy–Weinberg law is applicable only to small populations.	1	1
14.	Hybrid vigour is commonly observed in the F_1 generation.	1	1
15.	Spontaneous generation states that life arises only from pre-existing life.	1	1
	MATCH THE FOLLOWING. (5 X 1 =5)	**CO**	**KL**
16.	Kernel colour in Maize - Mutation theory	1	1
17.	Colour blindness - Mutation detection	1	1
18.	Muller CIB technique - Multiple gene inheritance	1	1
19.	Pure line selection - Sex linked inheritance	1	1
20.	De Vries - Self -pollinated crops	1	1

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Q. No.	SECTION B (8 X 2 =16) ANSWER ANY EIGHT OF THE FOLLOWING IN 50 WORDS.	CO	KL
21.	What is a test cross?	2	2
22.	Differentiate point and chromosomal mutation.	2	2
23.	Distinguish allelic and non-allelic interactions.	2	2
24.	List the importance of chromosomal mapping.	2	2
25.	What is haemophilia?	2	2
26.	What do you understand from survival of the fittest?	2	2
27.	Why is emasculation important in plant hybridization?	2	2
28.	Distinguish mutation and mutagenesis.	2	2
29.	Recall abiogenesis.	2	2
30.	Define Hardy Weinberg Law.	2	2
Q. No	**SECTION C (4 X 6 =24) ANSWER THE FOLLOWING IN 200 WORDS.**	**CO**	**KL**
31.	Support the law of independent assortment with an example.	3	3
	(or)		
32.	Explain the plastid inheritance in *Mirabilis jalapa.*	3	3
33.	Analyse the Hardy Weinberg equilibrium and its role in evolution.	3	3
	(or)		
34.	Explain the procedure involved in pure line selection.	3	3
35.	Write in short on chromosomal aberrations.	4	4
	(or)		
36.	Differentiate and analyze the role of domestication and introduction in plant breeding.	4	4
37.	Illustrate incomplete dominance with suitable example.	4	4
	(or)		
38.	Explain the postulates of Darwin's theory of Natural Selection.	4	4
Q. No.	**SECTION D (2 x 20 = 40) ANSWER THE FOLLOWING IN 1000 WORDS. DRAW DIAGRAMS WHEREVER NECESSARY.**	**CO**	**KL**
39.	Describe the complementary and supplementary gene interaction with suitable illustrations.	5	5
	(or)		
40.	Give a detailed account on Linkage and crossing over. Add a note on their significance.	5	5
41.	Elaborate the types, induction and the role of polyploidy in crop improvement.	5	5
	(or)		
42.	Elucidate the chemosynthetic origin of life on earth.	5	5

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