LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **PLANT BIOLOGY AND PLANT BIOTECHNOLOGY**

FIFTH SEMESTER – **APRIL 2024**

UPB 5502 – GENETICS AND PLANT BREEDING

Date: 17-04-2024 Dept. No. Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

Draw diagrams / flowcharts wherever necessary.

	SECTION A - K1 (CO1)
	Answer ALL the Questions **(10 x 1 = 10)**
1.	**Fill in the blanks**
a)	The _____is also known as the law of purity of gametes.
b)	In linkage maps, the distance is expressed as _____ .
c)	The anticodon is found in _____ .
d)	_____refer to changes in number of sets of chromosomes.
e)	_____ is the process of adopting wild plants under human control.
2.	**State whether the following statements are True or False**
a)	The phenotypic ratio of codominance is 3:1.
b)	*Neurospora crassa* is used as a model organism because it is easy to grow and has a haploid life cycle.
c)	In DNA molecule, the two strands are parallel to each other.
d)	Transposons were identified by Francis Crick.
e)	Heterosis is also known as hybrid vigour.
	SECTION A - K2 (CO1)
	Answer ALL the Questions **(10 x 1 = 10)**
3.	**Choose the correct answer**
a)	Mendel selected pea plant for his experiments because a) Easy to grow b) several contrasting characters. C) Easy to count d) easy to harvest
b)	Ratio 9:7 is due to a) supplementary genes b) complementaty genes c) lethal genes d) epistatic genes
c)	*Lac* operon was discovered by a) Watson and Crick b) Bateson and Punnett c) Hardy and Wienberg d) Jacob and Monod
d)	Polyploidy can be induced by a) mustard gas b) heavy metals c) continuous exposure to sunlight d) colchicine
e)	Emasculation and bagging is done to avoid a) cross pollination b) contamination c) breeding d) insects
4.	**Answer the following**
a)	Comment on lethal genes.
b)	Mention the significance of Tetrad analysis.
c)	Write a note on supercoiled DNA.
d)	State Hardy Weinberg law.
e)	Write a note on domestication?

SECTION B - K3 (CO2)	
Answer any TWO of the following each in about 500 words.	**(2 x 10 = 20)**
5.	Write notes on various types of RNA.
6.	Construct a flow chart to explain protein synthesis.
7.	Explain the structure of transposable elements and their importance.
8.	Narrate the selection methods for plant breeding experiments.
SECTION C – K4 (CO3)	
Answer any TWO of the following each in about 500 words.	**(2 x 10 = 20)**
9.	Compare and contrast Incomplete dominance and codominance.
10.	Explain the events in replication.
11.	Classify the various types of polyploidy.
12.	Explain the various steps involved in introduction of plants.
SECTION D – K5 (CO4)	
Answer any ONE of the following in about 1000 words.	**(1 x 20 = 20)**
13.	Summarize the various modifications of monohybrid cross.
14.	Explain the various steps in hybridization of plants. Add a note on their applications.
SECTION E – K6 (CO5)	
Answer any ONE of the following in about 1000 words.	**(1 x 20 = 20)**
15.	Construct a model to explain Gene regulation in prokaryotes.
16.	Elaborate on the various DNA repair mechanisms.

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