LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

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

FIFTH SEMESTER – **NOVEMBER 2024**

UPB 5502 – GENETICS AND PLANT BREEDING

Date: 11-11-2024 Dept. No. Max. : 100 Marks

Time: 09:00 am-12:00 pm

	SECTION A - K1 (CO1)	
	Answer ALL the Questions	**(10 x 1 = 10)**
1.	**Fill in the blanks**	
a)	The crossing of F1 to the recessive parent is known as _____ .	
b)	When Rh- woman marries Rh+ man, the child may get _____ .	
c)	Lac operon is functional in the _____ of glucose and _____ of lactose.	
d)	The chemical mutagen _____ is also used in cooking.	
e)	_____ cannot grow in the wild environment.	
2.	**State whether the following statements are TRUE or FALSE**	
a)	The only reason Mendel chose pea plant was that it can be easily grown.	
b)	In incomplete dominance, both alleles are expressed in first generation.	
c)	Eukaryotic DNA is split DNA with many copy numbers.	
d)	Thymine dimers in DNA are caused by UV light.	
e)	Polyploids are common in plants because they self pollinate and has no sexual dimorphism.	
	SECTION A - K2 (CO1)	
	Answer ALL the Questions	**(10 x 1 = 10)**
3.	**Choose the correct answer**	
a)	Which term represents a pair of contrasting characters? 1. Heterozygous 2.Homozygous 3.Codominant genes 4.Allelomorphs	
b)	9:7 ratio in the F2 generation represents 1. Incomplete dominance 2. Co-dominance 3.Epistasis 4. Complementary interaction.	
c)	In eukaryotes, DNA replication is initiated by 1. DNA primers 2. RNA primers 3. Both DNA and RNA primers 4. PCR	
d)	Transposable elements can move from 1. cell to cell 2. Organism to organism 3. Chromosome to chromosome 4. All of these	
e)	In hybridization, bagging is done to avoid 1. pollination 2.pathogen infestation 3. transpiration 4. Pollution.	
4.	**Answer the following, each in about 50 words**	
a)	Differentiate Codominance and incomplete dominance.	
b)	Define Criss cross inheritance.	
c)	What is Polycistronic mRNA?	
d)	Define Photoreactivation.	
e)	What is Emasculation?	
	SECTION B - K3 (CO2)	
	Answer any TWO of the following in 500 words **Draw diagrams / flowcharts wherever necessary**	**(2 x 10 = 20)**
5.	Demonstrate Polygenic inheritance with suitable examples.	
6.	Relate linkage and crossing over with chromosome mapping.	
7.	Illustrate the types of RNA.	
8.	Interpret Hardy Weinberg law.	

	SECTION C – K4 (CO3)
	Answer any TWO of the following in 500 words (2 x 10 = 20) **Draw diagrams / flowcharts wherever necessary**
9.	Highlight the significance of tetrad analysis in gene mapping studies.
10.	Discover DNA structure and the properties for a heritable molecule.
11.	Explain the various stages of hybridization in plant breeding.
12.	Point out and explain the various DNA repair mechanisms.
	SECTION D – K5 (CO4)
	Answer any ONE of the following in 1000 words (1 x 20 = 20) **Draw diagrams / flowcharts wherever necessary**
13.	Evaluate the various Mendel laws with his experiments.
14.	Summarise the events in the Replication of DNA and the enzymes involved.
	SECTION E – K6 (CO5)
	Answer any ONE of the following in 1000 words (1 x 20 = 20) **Draw diagrams / flowcharts wherever necessary**
15.	Discuss the causes for chromosomal aberrations, the types and the consequences.
16.	Elaborate on the gene regulation in lac operon. Explain how a mutation in repressor site effect on the gene regulation.

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