Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–V (NEW) EXAMINATION – WINTER 2020

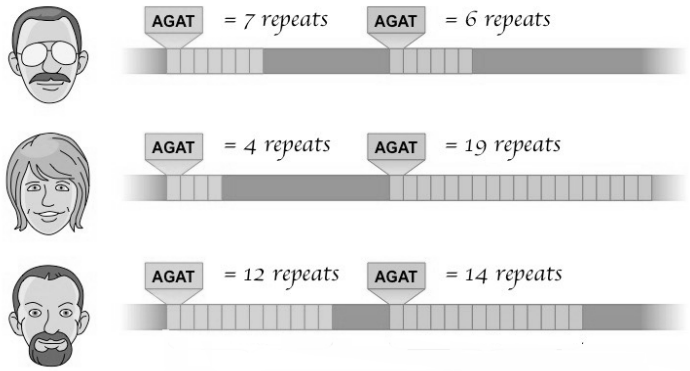
Subject Code:3150401 **Date:27/01/2021**

Subject Name:Advanced Molecular Biology

Time:10:30 AM TO 12:30 PM **Total Marks:56**

Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			Marks
Q.1	**(a)**	Explain the concept of a quantitative trait locus.	**03**
	(b)	Compare abiotic and biotic stress that plants undergo and explain in a paragraph any biotechnology method that is employed to overcome such stress elements.	**04**
	(c)	Using marker assisted selection is better than traditional selective breeding. Explain this statement.	**07**
Q.2	**(a)**	Explain the process of conjugation.	**03**
	(b)	What are transposons? Explain the mechanism of any one type of transposon.	**04**
	(c)	 Evaluate the figure given in the question and determine the type of molecular marker being used in the figure. Explain the process of using this marker to distinguish between individuals.	**07**
Q.3	**(a)**	Explain the role of Homologous recombination for generation of of transgenic mice.	**03**
	(b)	Differentiate between positive and negative regulation of operon.	**04**
	(c)	Gene A is suspected to be a tumor suppressor gene. You are given a Lab with mice and access to Crispr-Cas 9 guide RNA cassette ready for expression in mice, how will you evaluate the function of Gene A?	**07**
Q.4	**(a)**	Why is the *C.elegans* or the worm model used for studying developmental biology? What are the different stages of development of a *C. elegans* worm?	**03**
	(b)	Differentiate between transgenic mice and knockout mice.	**04**
	(c)	What is tmRNA? Explain mechanism of transcriptional regulation by tmRNA.	**07**
Q.5	**(a)**	Explain Intein-based vectors in detail.	**03**
	(b)	Explain blunt and cohesive ends.	**04**
	(c)	What is genetic engineering? Explain different tools used in genetic engineering.	**07**

Q.6	**(a)**	Compare cDNA and genomic library.	**03**
	(b)	Explain type and properties of restriction endonuclease.	**04**
	(c)	What is vector? Give basic properties of vector. Explain artificial chromosome (BAC, YAC) as a vector.	**07**
Q.7	**(a)**	What is constitutive and inducible gene?	**03**
	(b)	What are inclusion bodies? How can inclusion bodies formation be reduced?	**04**
	(c)	Explain mechanism of attenuation in trp operon.	**07**
Q.8	**(a)**	Explain the term operon. Explain its basic structure.	**03**
	(b)	What is difference between phagemid and cosmid vector?	**04**
	(c)	What is plasmid? Explain any one plasmid vector along with its screening process.	**07**

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