

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-V (NEW) EXAMINATION – WINTER 2024

Subject Code:3150401

Date:28-11-2024

Subject Name: Advanced Molecular Biology

Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) What are constitutive and inducible genes? Are operons inducible? Justify your answer. **03**
- (b) What is riboswitch? Explain how it regulates gene with an example. **04**
- (c) Explain mechanism of transcriptional regulation by attenuation with an example. **07**
- Q.2** (a) What does PCR stand for? What are basic requirements and steps involved in PCR **03**
- (b) Explain histone modification and chromatin remodeling. **04**
- (c) Explain siRNA based gene regulation in eukaryotes **07**
- OR**
- (c) What are His tag vectors? What are drawbacks of using it and how can it be overcome? **07**
- Q.3** (a) Enlist various tools used in genetic engineering. Explain any two. **03**
- (b) Write a note on wheat germ line expression system **04**
- (c) What are restriction enzymes? How are they different from other nucleases? Explain properties of their cutting sites and nature of ends generated. **07**
- OR**
- Q.3** (a) Explain reporter and reporter assay **03**
- (b) Write a note on plant based vector. **04**
- (c) Explain various screening strategies for library. **07**
- Q.4** (a) What is gene therapy? What are its advantages and limitations? **03**
- (b) What are transgenic and knock out mice? **04**
- (c) Explain genome editing with CRISPR CAS with an example. **07**
- OR**
- Q.4** (a) What are RAPD and RFLP markers? **03**
- (b) Explain principle and application of DNA Finger printing technique. **04**
- (c) Explain meat adulteration using DNA based methods **07**
- Q.5** (a) Explain the phage display technique in brief. **03**
- (b) Explain different types of donors in conjugation process. **04**
- (c) Explain strategy for introducing biotic and abiotic stress resistance in plants. **07**
- OR**
- Q.5** (a) What are transposable elements? **03**
- (b) Compare generalized and specialized transduction. **04**
- (c) Explain genetic basis for creation of disease resistance in animals **07**
