

**GUJARAT TECHNOLOGICAL UNIVERSITY****B.E. Sem-IV Examination June- 2010****Subject code: 140401****Subject Name: Molecular Biology and Genetics****Date: 17/ 06 / 2010****Time: 10.30 am – 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.

- Q.1** (a) Why did Mendel use pea as experimental material in his hybridization experiment? Give an account of his procedure and method of drawing conclusions from the results of his experiment. **07**
- (b) Explain binding between t-RNA and amino acid with the help of Aminoacyl t-RNA synthetase. **07**

- Q.2** (a) Explain replication mechanism in prokaryotes. **07**
- (b) In mice, a dominant allele C must be present in order for any pigment to be developed in coat. The kind of pigment produced depends on another locus, thus, B- produces black and bb produces brown. Individuals of cc genotype does not produce pigment and are called albinos. A homozygous black female is crossed to an albino male. (a) what phenotypic ratio is expected in the  $F_1$  and  $F_2$ ? Which type of epistatic interaction it is? **07**

**OR**

- (b) Give an account on kinds of linkage with suitable illustration. **07**
- Q.3** (a) Describe the experiment that proved DNA as genetic material in prokaryotes. **07**
- (b) Explain extranuclear inheritance by endosymbionts giving example of Kappa particles. **04**
- (c) Write a short note on pleiotropism. **03**

**OR**

- Q.3** (a) Give an account on different autosomal and sex chromosomal disorders. **07**
- (b) Explain solenoid model in detail. **04**
- (c) Write a short note on denaturation of DNA. **03**

- Q.4** (a) Explain post transcriptional modification of m-RNA. **07**
- (b) Describe Conservative, Semi-conservative and Dispersive model of DNA replication. **04**
- (c) Define : Hogness box, Unidirectional replication, Codon **03**

**OR**

- Q.4** (a) Explain post transcriptional modification of t-RNA. **07**
- (b) Explain mechanism of transcriptional termination in prokaryotes. **04**
- (c) Define : Pribnow box, Bidirectional replication, Anticodon **03**
- Q.5** (a) Write a short note on genetic code and its properties. **07**
- (b) Explain post translational modification. **07**

**OR**

- Q.5** (a) Explain elongation and termination mechanism of translation in both prokaryotes and eukaryotes. **10**
- (b) Explain Wobble hypothesis. **04**

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