

GUJARAT TECHNOLOGICAL UNIVERSITY**B. E. Sem - IV Examination - June- 2011****Subject code: 140401****Subject Name: Molecular Biology and Genetics****Date: 06/06/2011****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) Explain replication mechanism in prokaryotes with a neat diagram. **07**
 (b) Narrate the experiment to prove DNA as a genetic material in prokaryotes. **07**

- Q.2** (a) Explain inheritance of Z linked Recessive genes in Moths with a suitable example. **07**
 (b) In Drosophila, the ratio between the number of X chromosomes and the number of sets of autosomes (A) is called the sex index. Diploid females have ratio 1.0, diploid males have ratio 0.5, index values between 0.5 and 1.0 gives rise to intersex, values over 1.0 produces superfemales and under 0.5 produces supermales. Calculate the sex index and the sex phenotype in following individuals a) AAX b) AAXXY c) AAAXX d) AAXX e) AAXXX f) AAAXXX g) AAY **07**

OR

- (b) Four comb shapes namely rose, pea, walnut and single in poultry are known to be governed by two gene loci. The genotype R-P- produces walnut comb, R-pp produces rose comb, rrP- produces pea comb, rrpp produces single comb. Determine the proportion of comb types that would be expected in the offspring from following crosses (a) Rrpp x RrPP (b) rrPp x RrPp (c) rrPP x RRPP (d) RrPp x rrpp (e) RrPp x RRpp (f) RRpp x rrpp (g) RRPP x rrpp **07**

- Q.3** (a) Explain transcription mechanism in eukaryotes. **10**
 (b) Discuss Wobble hypothesis. **04**

OR

- Q.3** (a) Explain Translation mechanism in prokaryotes **10**
 (b) Describe processing of r-RNA. **04**

- Q.4** (a) Write a short note on genetic code and its properties. **07**
 (b) Write a short note on denaturation of DNA. **04**
 (c) Define: Shine dalgarno sequence, Codon, Unidirectional replication **03**

OR

- Q.4** (a) Explain structure of t-RNA. **07**
 (b) Explain modes of DNA replication. **04**
 (c) Define : Promoter, Anticodon, Bidirectional replication **03**

- Q.5** (a) Explain the mechanism of meiotic crossing over with a diagram. **07**
 (b) Explain disorders occurring at chromosomal level. **07**

OR

- Q.5** (a) What is linkage? Explain the types of linkage by drawing suitable crosses. **10**
 (b) Define and explain Mendel's law of segregation. **04**
