(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 154406 Roll No. | | | | | | | | | | |

B.Tech.

(SEM. IV) THEORY EXAMINATION 2013-14

GENETICS & MOLECULAR BIOLOGY

Time : 3 Hours *Total Marks : 100*

Note :- Attempt **all** questions. All questions carry equal marks.

1. Attempt any **two** of the following : **(10×2=20)**
   (a) What do you understand by alleles ? Explain multiple alleles with the help of suitable example.
   (b) If four babies are born at given hospital on the same day :
      (i) What is the chance that two will be boys and two girls ? Explain why.
      (ii) What is the chance that all four will be girls ? Explain why.
      (iii) What combination of boys and girls among four babies is most likely to occur ? Why ?
      (iv) If a certain family has four girls, what is the chance that fifth child will be girl ?
   (c) How did the transformation experiments of Griffith differ from the work of Avery and his associates ? Explain with the help of suitable example.
2. Attempt any **four** of the following : **(5×4=20)**
   (a) What do you mean by polygenic trait ? Explain with the help of suitable example.
   (b) What do you understand by LMU ? Discuss its significance.
   (c) Write short notes on Co-dominance.

(d) Discuss law of segregation with suitable example.

(e) What is the difference between test cross and back cross ? Also discuss the importance of test cross.

3. Attempt any **two** of the following : **(10×2=20)**

(a) How the linked genes could be mapped by two point and three point test crosses ? Explain with suitable example.

(b) What is epistasis ? Describe recessive epistasis with suitable example.

(c) The $X_g^{(b+)}$ allele is dominant and X linked. If a woman, heterozygous for this gene $[X_g^{(b+)} X_g^{(b-)}]$ is married to a man carrying the allele $X_g^{(b-)}$, what is the probability that :

(i) Each daughter will receive the $X_g^{(b+)}$ gene ?

(ii) Each son will receive the $X_g^{(b+)}$ gene ?

4. Attempt any **two** of the following : **(10×2=20)**

(a) What are the mutagens ? Describe the types of mutation. Also discuss the characteristics of point mutation.

(b) What is post transcriptional modification ? Mention its importance.

(c) Explain the mechanism and regulation of translation of eukaryotes.

5. Attempt any **two** of the following : **(10×2=20)**

(a) What is transposon mediated mutagenesis ? Compare it with PCR based mutagenesis.

(b) Discuss XX-YY mechanisms of sex determination with suitable example.

(c) Write short notes on the following :

(i) Linkage and Crossing over.

(ii) Lethal Gene.