M.Sc. Examination, 2017
Semester – IV
Zoology
Paper – MZOT – 402
(Molecular Genetics)

Time: 4 hours **Full Marks: 80**

Questions are of value as indicated in the margin.

Answer any ***eight*** questions

1. How can you differentiate between a normal and cancer cell? Classify cancer based on their origin. 4+6 = 10

2. What is site specific mutagenesis? Describe the process of inducing mutation using CRISPR-Cas9 technique. 2+8 = 10

3. What are proto oncogenes? Describe their functions in normal cells. 2+8 = 10

4. Differentiate between homeobox and homeodomain. Name the homeotic genes you studied in *Drsophila* and discuss about their nature of functions and fate of mutations. 2+2+3+3 = 10

5. Name four tumor suppressor genes. Why they are named so? Discuss the functions of any two such genes and mention how their functions are altered due to mutations. 2+2+6 = 10

6. Name the segmentation genes in Drosophila and their role in development. Mention about their mutations. 6+2+2 = 10

7. What are maternal genes? Mention about the localization of the mRNAs and proteins of the maternal genes you have studied. How do they regulate the developmental process? 2+6+2 = 10

8. How do proto oncogenes are mutated to oncogenes? Give examples about the different chromosomal translocations commonly found in cancer cells. 6+4 = 10

9. What are the differences between *v-oncs* and *c-oncs*? Describe the role of different viruses in oncogenesis. 2+8 = 10

10. Write ***any two*** from the following: 5+5 = 10
    a) RAPD
    b) RFLP
    c) Chromosome painting
    d) Site directed mutagenesis using PCR

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