

M.Sc. Examination, 2019

Semester-IV

Zoology

Paper – MZOT-402(v)

(Molecular Genetics)

Time: 4Hours

Full Marks: 80

Questions are of value as indicated in the margin.

Answer **any eight** questions.

1. Diagrammatically describe role of maternal effect genes, segmentation genes and homeotic genes in *Drosophila* embryogenesis. What do you mean by imaginal discs? What is morphogen? Give an example. 6+2+1+1=10
 2. With the help of diagrams describe the function of segmentation genes as defined by mutations. Differentiate between segments and Para segments. Graphically represent anterior posterior concentration of *bicoid* mRNA and Bicoid protein. 6+2+2=10
 3. What is the function of bithorax complex? Name the genes that constitute the complex. Explain the co-linearity rule in *Drosophila*. Write the consequences of mutations in *Ubx* and *Antp* genes. Explain the terms 'homeobox' and 'homeodomain' with suitable examples. 1+2+2+2+3=10
 4. Define oncogene with examples. Differentiate between *v-oncs* and *c-oncs*. With suitable examples explain the mutations that convert cellular proto-oncogenes to oncogenes. 2+2+6=10
 5. Describe two breast cancer tumor suppressor genes. Diagrammatically explain the role of p53 in cell cycle regulation. 4+6=10
 6. Describe the functions of proto-oncogenes. With the help of a diagram elaborate the role of pRB in cell cycle regulation. 6+4=10
 7. Describe the process of RFLP with suitable diagrams. Differentiate between dominant and co-dominant markers with examples. 7+3=10
 8. Describe the process of DNA fingerprinting. What is the full form of SSCP? Describe the SSCP analysis briefly. 7+1+2=10
 9. Describe the process of PCR-based site-specific mutagenesis. Write briefly about STS. 7+3=10
 10. Write **any two** short notes from the following: 5+5=10
 - (a) RAPD
 - (b) AFLP
 - (c) DNA microarray
 - (d) FISH
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