

Total No. of printed pages = 4

3 (Sem 4) ZOO M2

2015

ZOOLOGY

(Major)

Theory Paper : M-4.2

Full Marks – 60

Time – 2½ hours

The figures in the margin indicate full marks
for the questions.

1. Answer the* following : 1×7=7
 - (a) Which one of the human chromosomes has the lowest number of genes ?
 - (b) Name the type of point mutations which occur due to insertion or deletion of single base in DNA causing rest of the codons beyond the point to be read out differently.
 - (c) Write the base sequences in the nontemplate strand of DNA for the formation of m-RNA having base sequences - UCGGCAGUAAC.

[Turn over

- (d) All structural aberrations in chromosomes are produced following chromosome breakage. – Write true or false.
- (e) What are the three allelomorphic genes of the wild gene - I (isoagglutinin) for human blood groups ?
- (f) Write the modified form of Central Dogma of Biology.
- (g) What is the number of crossover and noncrossover chromatids in a tetrad after crossing over ?

2. Answer the following briefly : $2 \times 4 = 8$

- (a) Who first suggested the triplet nature of Genetic Codes ? Write about the degenerate coding system with appropriate example.
- (b) Give brief account of the mode of inheritance of mitochondrial DNA.
- (c) What is meant by the structural genes in a Lac operon ? Name different structural genes mentioning the enzymes for which the genes are responsible.

- (d) What is the type of radiation the UV-rays are ? What components of DNA are the targets of this radiation. Mention two direct effects of UV radiation on DNA molecules.

3. Answer any three questions from the following : $5 \times 3 = 15$

- (a) Write about different structural components of a Synaptonemal complex. Mention its role in the process of crossing over. $3 + 2 = 5$
- (b) What is meant by a semiconservative and semidiscontinuous type of DNA replication ? Name different components of a replisome and write their role in the DNA replication process. $2 + 3 = 5$
- (c) Distinguish between Back cross and Test cross. Write how a dihybrid test cross ratio is obtained, giving an example. $2 + 3 = 5$
- (d) Explain the genic balance theory of sex determination in *Drosophila*. 5
- (e) Illustrate with example the preparation of linkage map. In what unit the recombination frequencies are expressed ? $4 + 1 = 5$

4. Explain various autosomal and sexchromosomal genetic disorders in man. 10

Or

What is polyploidy ? Discuss different kinds of polyploids. Give brief account on the phenotypic effects of polyploidy in organisms. 1+6+3=10

5. Give detail account of the structure and functions of various types of RNA. 10

Or

What do you mean by mutation in molecular level ? Describe various mechanisms of change in gene at nucleic acid level. 2+8=10

6. What are the two major events of protein synthesis ? Discuss how these two events are regulated during biosynthesis of protein molecule. 2+8=10

Or

Explain the processes involved in recombination of genetic materials in bacteria and viruses. 5+5=10