

2018

ZOOLOGY

(Major)

Paper : 4.2

(Genetics)

Full Marks : 60

Time : 3 hours

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

1. Answer the following as directed : $1 \times 7 = 7$

(a) Translocation involves exchange of segments between non-homologous chromosomes.

(State True or False)

(b) 30% of nucleotides in DNA from the locust is 'A', what will be '%' value for 'T' [A = T]?

(c) Morgan and Castles formulated 'the chromosome theory of linkage' in the year of 1812/1910/1912.

(Choose the correct answer)

- (d) The strength of linkage is inversely proportional to distance between the genes.

(State True or False)

- (e) The point at which homologous chromosome forms a cross is called _____.

(Fill up the blank)

- (f) The graphic representations of genes are known as _____.

(Fill up the blank)

- (g) The initiator and terminator codons are known as signals and this phenomenon is known as a recombination/conjugation/punctuation.

(Choose the correct answer)

2. Give brief answer to the following : $2 \times 4 = 8$

- (a) What is tautomerization?
- (b) Write the differences between nucleotides and nucleosides.
- (c) Write the differences between transformation and transduction in bacteria.
- (d) What do you mean by mitochondrial DNA?

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

- (a) Write a note on Tobacco Mosaic virus.
- (b) Describe the role of DNA polymerase enzymes in the process of DNA replication.
- (c) Explain incomplete dominance and codominance with suitable example.
- (d) How is crossing over greatly reduced by the phenomenon of interference and coincidence?

4. Define crossing over. Illustrate the structure of synaptonemal complex with its significance. $1+6+3=10$

Or

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

5. Write down the salient features of multiple allele. Explain this phenomenon taking 'ABO' blood groups and their inheritance. $3+7=10$

Or

What is nucleic acid? Write the biological significance of Watson and Crick Model of DNA. $4+6=10$

6. Explain the process involved in recombination of genetic material in bacteria and virus.

5+5=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
