3 (Sem–5/CBCS) ZOO HC 2

2021

(Held in 2022)

ZOOLOGY

(Honours)

Paper : ZOO–HC–5026

(Principles of Genetics)

Full Marks : 60

Time : Three hours

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

1. Fill in the blanks : 1×7=7

   (a) The term 'gene' is coined by _____.

   (b) When both alleles expresses together, it is known as _____.

   (c) The distance between genes is called _____ unit.

(d) The phenomenon of one gene masks the expression of another gene is called _____.

(e) Barr body is an inactivated form of _____ chromosome.

(f) The full form of SINE is _____.

(g) A virus that infects bacteria is called _____.

2. Answer the following briefly : ***(any four)*** 2×4=8

(a) Write the differences between sex-linked and sex-influenced inheritance.

(b) What is a CLB method ? What is its use ?

(c) Explain polygenic inheritance with suitable examples.

(d) What do you mean by Kappa particles ?

(e) Write the significance of mutation.

3. Answer ***any three*** questions from the following : 5×3=15

(a) Discuss the complementary gene interaction with suitable illustration. 5

(b) Describe the mechanism of linkage in the context of coupling and repulsion hypothesis. 5

(c) What is somatic cell hybridization ? Write the application of somatic cell hybridization. 2+3=5

(d) What is sex determination ? Write about the 'genic balance theory' of sex determination. 2+3=5

(e) What do you mean by frame-shift mutation ? Discuss its probable causes. 3+2=5

4. What is multiple allele ? Write the characteristics of multiple alleles. Discuss the phenomenon of multiple allele in the light of inheritance of blood group in human. 2+3+5=10

Or

What do you mean by mitochondrial inheritance ? Mention the characteristics of extra-chromosomal inheritance. Discuss the maternal effect in Snail's shell coiling with proper illustration. 2+3+5=10

5. Define crossing over. Discuss the molecular mechanism of crossing over with suitable diagram. Give a brief note on its significance. 2+6+2=10

Or

What is transduction ? Discuss the phenomenon of generalized and specialized transduction with suitable diagram. 2+8=10

6. Define mutation. Describe different types of chromosomal aberration in context to structural changes with suitable examples. 2+8=10

Or

What is transposable element ? Mention different types of transposable elements in human. Discuss the medical significance of transposable element. 3+5+2=10