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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.

Contd.

- (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