

Total number of printed pages-4

**3 (Sem -5/CBCS) ZOO HC 2**

**2023**

**ZOOLOGY**

(Honours Core)

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. Choose the correct answer : 1×7=7

(a) In humans mechanism of sex determination is \_\_\_\_\_

- (i) XX-XY; male heterogamety
- (ii) XX-XX; female heterogamety
- (iii) XX-XO; female heterogamety
- (iv) XX-XO; male heterogamety

Contd.

(b) Kappa particles are responsible for extra chromosomal inheritance. *Say yes or no.*

(c) A gene that affect more than one phenotype is called as \_\_\_\_\_.

(d) Morphan's syndrome is as a result of

(i) Polygene

(ii) Pseudogene

(iii) Modifier gene

(iv) Pleotropic gene

(e) All genes on the sex chromosomes are gender specific. *Say true or false.*

(f) Cytoplasmic inheritance is carried out by \_\_\_\_\_ genes.

(g) A gene with a Y chromosome is expressed exclusively in man/in women.

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

(a) What is three point test cross ?

(b) Define induced mutation.

(c) What are base analogues ?

(d) What is transduction ? Who first describe this phenomenon ?

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

(a) Explain incomplete dominance and codominance with suitable example.

(b) Describe Mendel's monohybrid experiment and state the conclusion derived.  $3 + 2 = 5$

(c) Describe the attached X method of mutation with suitable illustration.

(d) What is mar unit ? Describe the coupling and repulsion hypothesis of linkage.  $1 + 4 = 5$

(e) Define aneuploidy. Discuss about different conditions of aneuploidy.  $1 + 4 = 5$

4. (a) What do you mean by interaction of gene ? Describe the supplementary gene interaction with suitable illustration. Add a note on lethal allele.  $2 + 5 + 3 = 10$

**Or**

(b) What is synapsis ? Write about terminalization stage of crossing over. Explain the molecular mechanism of crossing over with suitable diagram.  $1 + 2 + 7 = 10$

5. (a) Define silent mutation. Explain the molecular basis of gene mutation. Write down the methods used to detect sex lethal mutation.  $1+6+3=10$

Or

- (b) What is uniparental inheritance ? How does it differ from Mendelian inheritance ? Discuss the inheritance pattern of Kappa particles in paramoecium.  $2+2+6=10$

6. (a) What do you mean by episome ? Explain the conjugation process in bacteria with suitable illustrations.  $2+8=10$

Or

- (b) What are insertion sequences ? Give an account of different types of eukaryotic transposons. Add a note on genetic significance of transposons.  $2+6+2=10$