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3 (Sem–5/CBCS) ZOO HC 2

2023

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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 : 2×4=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 : 5×3=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