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(NEP—2020)

(4th Semester)

ZOOLOGY (MAJOR)

(Genetics)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

(SECTION : A—OBJECTIVE)

(Marks : 10)

Tick (✓) the correct answer in the brackets provided :

1×10=10

1. When one gene influences more than one phenotypic trait, the phenomenon is called

- (a) point mutation ()
- (b) epistasis ()
- (c) codominance ()
- (d) pleiotropism ()

2. Mitochondrial inheritance is an example of

- (a) vertical inheritance ()
- (b) cytoplasmic inheritance ()
- (c) bi-parental inheritance ()
- (d) Mendelian inheritance ()

3. Which of the following is an example of genetic disease caused by nondisjunction of chromosomes?
- (a) Hemophilia ()
 - (b) Cri-du-chat ()
 - (c) Turner syndrome ()
 - (d) Porphyria ()
4. The phenotypic ratio for genes showing complete linkage in monohybrid cross is
- (a) 1:1 ()
 - (b) 1:2:1 ()
 - (c) 1:1:1:1 ()
 - (d) 9:3:3:1 ()
5. Complete chromosomal crossover takes place during
- (a) diplotene ()
 - (b) leptotene ()
 - (c) pachytene ()
 - (d) zygotene ()
6. Consider the following normal sequence of gene 'h i j k l m'. The sequence 'h i k j m l' represents
- (a) translocation ()
 - (b) duplication ()
 - (c) deletion ()
 - (d) non-disjunction ()
7. Which of the following is an example of a human genetic disorder caused by transposon insertion?
- (a) Cystic fibrosis ()
 - (b) Huntington's disease ()
 - (c) Hemophilia ()
 - (d) Hemochromatosis ()

8. In ZZ-ZW mechanism of genotypic sex determination, ZZ represents
(a) both male and female ()
(b) male ()
(c) female ()
(d) intersex ()
9. In Griffith's transformation experiment, which particle is concluded as transforming particle?
(a) RNA ()
(b) DNA ()
(c) Protein ()
(d) Cell wall ()
10. Pedigree analysis is used to trace
(a) ancestors ()
(b) chromosomal mutation ()
(c) polygenic and monogenic diseases ()
(d) genetic disease inheritance ()

(SECTION : B—SHORT ANSWERS)

(Marks : 15)

Write short notes on *five* of the following, taking at least *one* from each Unit :

3×5=15

UNIT—I

1. Codominance
2. Pleiotropism

UNIT—II

3. Linkage maps
4. Paracentric inversion of chromosomal mutation

UNIT—III

5. Sex-determination by temperature
6. Structure of bacteriophage

UNIT—IV

7. Transgenesis
8. Pedigree of hemophilia

(SECTION : C—DESCRIPTIVE)

(Marks : 50)

Answer *five* questions, taking at least *one* from each Unit :

10×5=50

UNIT—I

1. Explain epistasis and write notes on different types of epistatic interactions.
2. Write a note on Mendel's laws of inheritance with suitable examples.

UNIT—II

3. Explain the different types of chromosomal anomalies.
4. What is crossing over? Write a note on the mechanism of crossing over.

UNIT—III

5. What are transposons? Describe several types of transposons.
6. Write a note on conjugation in bacteria.

UNIT—IV

7. Define stem cell. Explain the properties of stem cells.
8. Write short notes on the following :
 - (a) Klinefelter syndrome
 - (b) Turner syndrome
