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(CBCS)

(6th Semester)

ZOOLOGY

NINTH PAPER

(Molecular Biology and Genetics)

Full Marks : 75

Time : 3 hours

(SECTION : A—OBJECTIVE)

(*Marks : 10*)

The figures in the margin indicate full marks for the questions

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

1×10=10

1. Anticodon is present in

(a) DNA ()

(b) mRNA ()

(c) rRNA ()

(d) tRNA ()

2. In which stage are lampbrush chromosomes observed?

(a) Meiotic prophase ()

(b) Mitotic metaphase ()

(c) Mitotic prophase ()

(d) Mitotic anaphase ()

3. Which of the following enzymes separates the two strands of DNA during replication?
- (a) Gyrase ()
 - (b) Topoisomerase ()
 - (c) Helicase ()
 - (d) DNA polymerase ()
4. Which of the following repair mechanisms is responsible for the excision of DNA damaged induced by UV rays?
- (a) Base excision ()
 - (b) Nucleotide excision ()
 - (c) Mismatch ()
 - (d) Double-strand breakage ()
5. The sequence of the structural genes in the lac operon is
- (a) lacA—lacZ—lacY ()
 - (b) lacZ—lacY—lacA ()
 - (c) lacZ—lacA—lacY ()
 - (d) lacA—lacY—lacZ ()
6. Transcription is the transfer of genetic information from
- (a) DNA to RNA ()
 - (b) mRNA to tRNA ()
 - (c) DNA to mRNA ()
 - (d) tRNA to mRNA ()
7. When a single-gene affects a number of phenotypic traits, it is called
- (a) pleiotropism ()
 - (b) epistasis ()
 - (c) allelism ()
 - (d) co-dominance ()

8. When both alleles of a gene at a locus are partially expressed, it is known as
- (a) incomplete dominance ()
 - (b) co-dominance ()
 - (c) multiple alleles ()
 - (d) cytoplasmic inheritance ()
9. Crossing-over takes place in the
- (a) diakinesis stage ()
 - (b) anaphase stage ()
 - (c) leptotene stage ()
 - (d) pachytene stage ()
10. The karyotype of Klinefelter's syndrome is
- (a) 47 + XXY ()
 - (b) 46 + XXY ()
 - (c) 47 + XYY ()
 - (d) 47 + XXYY ()

(SECTION : B—SHORT NOTE)

(Marks : 15)

Write short notes on the following :

3×5=15

UNIT—I

1. Euchromatin

OR

2. tRNA

UNIT—II

3. Enzymes of DNA replication

OR

4. Mismatch repair

UNIT—III

5. Central dogma of molecular biology

OR

6. Concept of operon

UNIT—IV

7. Epistasis

OR

8. Co-dominance

UNIT—V

9. Down syndrome

OR

10. Non-disjunction

(SECTION : C—DESCRIPTIVE)

(Marks : 50)

The questions are of equal value

Answer the following questions :

UNIT—I

1. Describe the double-helical structure of DNA with suitable diagram.

OR

2. Write short notes on the following :

(a) Lampbrush chromosome

(b) Nucleosomes

UNIT—II

3. Explain the mechanism of DNA replication by semi-conservative method with diagram.

OR

4. Write a note on different types of DNA repair.

UNIT—III

5. Explain the process of translation in prokaryotic cell.

OR

6. Describe the mechanism of transcription in prokaryotic cell.

UNIT—IV

7. Explain Mendel's laws of inheritance with suitable examples.

OR

8. Write short notes on the following :

- (a) Multiple alleles
- (b) Incomplete dominance

UNIT—V

9. What is sex-linked inheritance? Explain this phenomenon with reference to man and *Drosophila* giving suitable examples.

OR

10. Write short notes on the following :

- (a) Turner syndrome
- (b) Linkage
