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(CBCS)

(6th Semester)

ZOOLOGY

NINTH PAPER

(Molecular Biology and Genetics)

Full Marks : 75

Time : 3 hours

(PART : A—OBJECTIVE)

(*Marks : 25*)

The figures in the margin indicate full marks for the questions

SECTION—A

(*Marks : 10*)

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

1×10=10

1. The loops of lampbrush chromosome are rich in

- (a) tRNA and DNA ()
- (b) mRNA ()
- (c) rRNA and proteins ()
- (d) DNA and proteins ()

2. The 3—OH of tRNA always ends with which of the following base sequences?

- (a) GGG ()
- (b) CCU ()
- (c) UCT ()
- (d) CCA ()

3. Enzymes that hydrolyze a polynucleotide chain into its component nucleotide are known as
- (a) polymerases ()
 - (b) ligases ()
 - (c) nucleases ()
 - (d) All of the above ()
4. In DNA replication, the strand which is synthesized continuously is called
- (a) Okazaki fragment ()
 - (b) lagging strand ()
 - (c) leading strand ()
 - (d) template strand ()
5. Which one of the following is involved in the synthesis of mRNA?
- (a) RNA polymerase I ()
 - (b) RNA polymerase II ()
 - (c) RNA polymerase III ()
 - (d) All of the above ()
6. The first step in central dogma of molecular biology is known as
- (a) initiation ()
 - (b) transcription ()
 - (c) translation ()
 - (d) elongation ()
7. Which one of the following is called 'law of purity of gametes'?
- (a) Law of segregation ()
 - (b) Law of dominance ()
 - (c) Law of independent assortment ()
 - (d) All of the above ()
8. ABO blood group is an example of
- (a) sex-linked inheritance ()
 - (b) non-disjunction of chromosomes ()
 - (c) pleiotropic genes ()
 - (d) multiple alleles ()

9. When an abnormal egg with XX chromosome is fused with a normal sperm carrying Y chromosome, it results in

- (a) Turner's syndrome ()
- (b) Down's syndrome ()
- (c) Patau's syndrome ()
- (d) Klinefelter's syndrome ()

10. Synapsis starts during

- (a) pachytene stage ()
- (b) diplotene stage ()
- (c) leptotene stage ()
- (d) zygotene stage ()

SECTION—B

(Marks : 15)

Write short notes on the following :

3×5=15

1. Structure of tRNA

OR

Labelled diagram of DNA

2. Double strand breakage

OR

Mismatch repair

3. Post-transcriptional modification of mRNA

OR

Characteristics of genetic code

4. Law of independent assortment

OR

Chromosome theory of inheritance

5. Sex-linked inheritance

OR

Klinefelter's syndrome

(PART : B—DESCRIPTIVE)

(Marks : 50)

The questions are of equal value

1. What is chromatin? Describe the structure of nucleosome.

OR

Write short notes on the following :

- (a) Polytene chromosome
- (b) Heterochromatin

2. Explain the semi-conservative method of replication in prokaryotic cells.

OR

Discuss different types of DNA damages and add a note on the mechanism of nucleotide excision repair and base excision repair.

3. What is transcription? Explain the process of transcription in prokaryotic cells.

OR

Write a note on lac operon.

4. Explain the inheritance of multiple alleles with suitable examples.

OR

Write short notes on the following :

- (a) Incomplete dominance
- (b) Epistasis

5. What is mutation? Explain different types of gene mutation.

OR

Write notes on the following :

- (a) Haemophilia
- (b) Down's syndrome
