

2 0 2 3

( CBCS )

( 6th Semester )

**ZOOLOGY**

NINTH PAPER

**( Molecular Biology and 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. The number of base pairs per helical turn in Watson and Crick's structure of DNA is

- (a) 9 ( ) (b) 10 ( )  
(c) 11 ( ) (d) 12 ( )

2. The different types of histone octamer in eukaryotic DNA are

- (a) H1, H2, H3 and H4 ( )  
(b) H1, 2H2, H3 and 2H4 ( )  
(c) H2A, H2B, H3 and H4 ( )  
(d) H1, H2A, H3 and H4 ( )

3. The origin of replication for DNA replication in prokaryotes is known as

- (a) oriC ( ) (b) oriB ( )  
(c) oriA ( ) (d) oriD ( )

4. The synthesis of DNA occurs in which direction?

- (a) 3-5 ( ) (b) 5-3 ( )  
(c) Both 5-3 and 3-5 ( ) (d) 5-5 ( )

5. Termination of transcription in prokaryotes occurs via protein is called  
 (a) helicase ( ) (b) RNA primase ( )  
 (c) gyrase protein ( ) (d) Rho protein ( )
6. The first mRNA codon to specify an amino acid is always  
 (a) GUG ( ) (b) AUG ( )  
 (c) UAC ( ) (d) UAG ( )
7. If the genotype consists of only one type of allele, it is called  
 (a) homozygous ( ) (b) heterozygous ( )  
 (c) genotype ( ) (d) phenotype ( )
8. ABO blood group is an example of  
 (a) incomplete dominance ( )  
 (b) complete dominance ( )  
 (c) codominance ( )  
 (d) epistasis ( )
9. Robertsonian translocation is found in which genetic disease?  
 (a) Cri du chat syndrome ( )  
 (b) Klinefelter syndrome ( )  
 (c) Turner syndrome ( )  
 (d) Haemophilia ( )
10. Which of the following diseases is not sex-linked inheritance?  
 (a) Haemophilia ( ) (b) Turner syndrome ( )  
 (c) Klinefelter syndrome ( ) (d) Down syndrome ( )

**( SECTION : B—SHORT ANSWER )**

( Marks : 15 )

Write notes on the following in 5 to 8 sentences each :

3×5=15

UNIT—I

1. Chargaff's rule

**OR**

2. Nucleosome

UNIT—II

3. DNA polymerase enzyme

**OR**

4. Nucleotide excision repair

UNIT—III

5. Promoters in transcription

**OR**

6. Activation of tRNA for initiation of translation

UNIT—IV

7. Multiple alleles

**OR**

8. Mendel's monohybrid cross

UNIT—V

9. Crossing-over

**OR**

10. XY mechanism of sex determination

**( SECTION : C—DESCRIPTIVE )**

( Marks : 50 )

Answer the following questions :

10×5=50

UNIT—I

1. Write an essay on different types of RNA.

**OR**

2. Describe polytene and lampbrush chromosomes with suitable diagram.

UNIT—II

3. Give an account on the experiment by Meselson and Stahl on semi-conservative mechanism of DNA replication.

**OR**

4. Explain the mechanism of repairs for DNA double strand breaks.

UNIT—III

5. Give an account on the genetic code.

**OR**

6. Write an account on gene regulation occurring in lactose operon.

UNIT—IV

7. Give an account on cytoplasmic inheritance.

**OR**

8. Write short notes on the following :  
(a) Chromosome theory of inheritance  
(b) Pleiotropism

UNIT—V

9. Explain the different types of mutation.

**OR**

10. Write short notes on the following :  
(a) Klinefelter syndrome  
(b) Haemophilia

★ ★ ★