DBK-003-2015034 Seat No. _____

# B. Sc. (Sem. V) (CBCS) Examination

**June - 2022**

## Genetics & Molecular Biology : BT-502

**Faculty Code : 003**
**Subject Code : 2015034**

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

**Instructions** : (1) Objective type of questions are compulsory.
(2) Write any 5 questions out of 10.

**1** (a) Answer the following : (one mark) **4**
(1) _____ gave the law of heredity.
(2) The principle of dominance is frequently referred to as Mendel's third law. (True/False)
(3) Theory of linkage is given by T.G. Morgan. True/False
(4) Human has 46 chromosomes and 23 linkage groups. True/False

(b) Answer the following : (2 marks) **2**
Define : Pseudogene and Pseudoallele

(c) Answer the following : (3 marks) **3**
Describe epistasis.

(d) Answer the following : (5 marks) **5**
Write a note on Sex determination.

**2** (a) Answer the following : (one mark) **4**
(1) What was the phenotypic ratio observed in monohybrid experiment ?
(2) _____ gave one gene one enzyme hypothesis.
(3) The gene as unit of recombination known as _____.
(4) _____ coined the term 'Gene'.

(b) Answer the following : (2 marks) **2**
Define : Linkage and linkage map.

(c) Answer the following : (3 marks) **3**
Explain interaction of gene.

(d) Answer the following : (5 marks) **5**
Write a note on Laws of mendalian inheritance.

**3** (a) Answer the following : (one mark) **4**
(1) The binomial equation of H W Law is _____.
(2) The infective symbiont kappa virus in paramecium is the example of Extra Nuclear Inheritance by Endosymbionts. True/False
(3) _____ gave the transforming principle.
(4) B form of DNA is not stable form of DNA. True/False.

(b) Answer the following : (2 marks) **2**
What is central dogma of life ?

(c) Answer the following : (3 marks) **3**
Explain direct and indirect evidence to prove DNA is hereditary material.

(d) Answer the following : (5 marks) **5**
Explain Genetic polymorphism.

**4** (a) Answer the following : (one mark) **4**
(1) Hardy Weinberg law uses binomial equation. True/False
(2) $CO_2$ sensitive drosophila contains sigma particles. True/False
(3) Full form of SNPs_____
(4) A-DNA is right handed helix similar to B-DNA. True/False

(b) Answer the following : (2 marks) **2**
What is genetic drift ?

(c) Answer the following : (3 marks) **3**
Describe extra chromosomal inheritance.

(d) Answer the following : (5 marks) **5**
Write a note on Genomic organization of prokaryotic cell.

**5** (a) Answer the following : (one mark) **4**
(1) Termination of DNA replication form ____ complex.
(2) 3' to 5' exonuclease activity is also known as polymerizing activity. True/False
(3) _____ discovered transposable elements in maize.
(4) The process of splicing is occurs during m-RNA processing. True/False

(b) Answer the following : (2 marks) **2**
What is jumping gene ?

(c) Answer the following : (3 marks) **3**
Describe process of conjugation.

(d) Answer the following : (5 marks) **5**
Write a note on enzyme involved in DNA replication.

**6** (a) Answer the following : (one mark) **4**
(1) _____ discovered semiconservative mode of DNA.
(2) All DNA polymerases possess proof reading activity. True/False
(3) Full form of NER _____
(4) Ori c is known as _____

(b) Answer the following : (2 marks) **2**
Give an example of composite transposons.

(c) Answer the following : (3 marks) **3**
Explain Ac-Ds Elements.

(d) Answer the following : (5 marks) **5**
Write a note on Transformation.

**7** (a) Answer the following : (one mark) **4**
(1) Synthesis of cDNA is carried out by _____ enzyme.
(2) If C is at the third position in the codon, according to wobble hypothesis _____ will be anticodon.
(3) LAC Y gene codes for _____
(4) AUG is the start codon. True/False

(b) Answer the following : (2 marks) **2**
(1) What is wobble hypothesis ?

(c) Answer the following : (3 marks) **3**
Explain general properties of genetic code.

(d) Answer the following : (5 marks) **5**
Write a note on regulation of gene expression in Trp operon.

**8** (a) Answer the following : (one mark) **4**
(1) Eukaryotes have _____ nuclear RNA polymerase.
(2) If A is at the third position in the codon, according to wobble hypothesis _____ will be anticodon.
(3) Full form of STRs_____
(4) The code is comma less. True/False

(b) Answer the following : (2 marks) **2**
What is role of t-RNA ?

(c) Answer the following : (3 marks) **3**
Describe G capping and Polyadenylation.

(d) Answer the following : (5 marks) **5**
Write a note on Prokaryotic post transcription modification.

**9** (a) Answer the following : (one mark) **4**

(1) Cosmid is the hybrid vector derived from plasmids containing cos site of $\lambda$-phage. True/False

(2) Full form of BACs is _____

(3) Western blotting is an immuno-detection method working on the principle of Ag-Ab reaction. True/False

(4) The plane of cutting in Sticky/Cohesive, if _____ enzyme is used to cut the DNA at restriction site.

(b) Answer the following : (2 marks) **2**
What is vectors ?

(c) Answer the following : (3 marks) **3**
What is nucleic acid hybridization ?

(d) Answer the following : (5 marks) **5**
Write a note on application of genetic engineering.

**10** (a) Answer the following : (one mark) **4**

(1) Cosmid is the artificial vector. True/False

(2) EcoR1 is type II restriction enzyme. True/False

(3) Full form of PUC _____

(4) The Palindromic sequence for Hind III enzyme is _____.

(b) Answer the following : (2 marks) **2**
What is YACs ?

(c) Answer the following : (3 marks) **3**
Write a note on gene cloning strategies.

(d) Answer the following : (5 marks) **5**
Write a note on expression vectors.

---