



BCG-003-1015034 Seat No. \_\_\_\_\_

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

**August – 2021**

**BT - 502 : Genetics And Molecular Biology**

**Faculty Code : 003**

**Subject Code : 1015034**

Time :  $2\frac{1}{2}$  Hours]

[Total Marks : 70

**Instructions:**

**(1) Objective types of questions are compulsory**

**(2) Write any 5 questions out of 10 questions**

**1 [A] Answer the following (One mark) [04]**

1. W.Johanson coined the term \_\_\_\_\_ that acts as hereditary units.
2. The principle of independent segregation is frequently referred to as Mendel's second law . TRUE/FALSE.
3. Suppose that the distance between the gene A-B =12, B-C =7 and A-C =5, determine the correct order of genes.
4. Man has 46 chromosomes and 23 linkage groups. TRUE/FALSE.

**[B] Answer the following (2 mark) [02]**

1. Define: Muton and Cistron.

**[C] Answer the following (3 mark) [03]**

1. Explain multiple allele with example.

**[D] Answer the following (5 mark) [05]**

1. Write a note on Sex determination.

**2 [A] Answer the following (One mark) [04]**

1. Hugo-De-Vries coined the term 'Gene'. TRUE/FALSE.
2. What was the phenotypic and genotypic ratio observed in 2<sup>nd</sup> the law of heredity?
3. Johanson gave one gene one enzyme hypothesis. TRUE/FALSE.
4. Man has \_\_\_\_\_ pairs of chromosome.

**[B] Answer the following (2 mark) [02]**

1. Define: Gene and Allele.

**[C] Answer the following (3 mark) [03]**

1. Explain Epistasis.

**[D] Answer the following (5 mark) [05]**

1. Write a note on Laws of heredity.

- 3 [A] Answer the following (One mark) [04]**
1. In H W Law, Binomial equation  $P^2+2pq+q^2=1$ . What  $2pq$  represents?
  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 the most stable form of DNA. TRUE/FALSE.

- [B] Answer the following (2 mark) [02]**
1. Define: C-value.

- [C] Answer the following (3 mark) [03]**
1. Explain Indirect Evidences to prove DNA as a genetic material.

- [D] Answer the following (5 mark) [05]**
1. Explain Genetic polymorphism.

- 4 [A] Answer the following (One mark) [04]**
1. Hardy Weinberg law uses binomial equation. TRUE/FALSE.
  2. Co2 sensitive drosophila contains sigma particales. TRUE/FALSE.
  3. Full form of Hfr \_\_\_\_\_.
  4. Z- DNA is the zigzag DNA. TRUE/FALSE.

- [B] Answer the following (2 mark) [02]**
1. What is central dogma of life?

- [C] Answer the following (3 mark) [03]**
1. State and elaborate Hardy Weinberg Law of equilibrium.

- [D] Answer the following (5 mark) [05]**
1. Explain and draw the basic form of DNA.

- 5 [A] Answer the following (One mark) [04]**
1. RNA Polymerase is the primary replicative enzyme. TRUE/FALSE.
  2. 3' to 5' exonuclease activity is also known as proof reading activity. TRUE/FALSE.
  3. \_\_\_\_\_ discovered transposable elements in maize.
  4. The \_\_\_\_\_ process directly reverses the damage by the action of enzyme photolyase.

- [B] Answer the following (2 mark) [02]**
1. What is recombination?

- [C] Answer the following (3 mark) [03]**
1. Explain Ac-Ds Elements.

- [D] Answer the following (5 mark) [05]**
1. Write a note on Prokaryotic replication.

- 6 [A] Answer the following (One mark) [04]**
1. DNA ligase joins DNA. TRUE/FALSE.
  2. All DNA polymerases possess Proof reading activity. TRUE/FALSE.
  3. Full form of IR \_\_\_\_\_.
  4. Full form of NER \_\_\_\_\_.
- [B] Answer the following (2 mark) [02]**
1. What is transposition?
- [C] Answer the following (3 mark) [03]**
1. Explain Conjugation.
- [D] Answer the following (5 mark) [05]**
1. Write a note on Transformation.
- 7[A] Answer the following (One mark) [04]**
1. Synthesis of \_\_\_\_\_ is carried out by enzyme reverse transcriptase.
  2. If G is at the third position in the codon, according to wobble hypothesis \_\_\_\_\_ will be anticodon.
  3. \_\_\_\_\_ gene codes for  $\beta$ -galactosidase.
  4. AUG is the stop codon. TRUE/FALSE.
- [B] Answer the following (2 mark) [02]**
1. What is wobble hypothesis?
- [C] Answer the following (3 mark) [03]**
1. Explain characteristics of genetic code.
- [D] Answer the following (5 mark) [05]**
1. Write a note on Lac operon.
- 8 [A] Answer the following (One mark) [04]**
1. Full form of mRNA \_\_\_\_\_.
  2. If A is at the third position in the codon, according to wobble hypothesis \_\_\_\_\_ will be anticodon.
  3. Full form of CAP \_\_\_\_\_.
  4. Genetic code is universal. TRUE/FALSE.
- [B] Answer the following (2 mark) [02]**
1. What is Operon?
- [C] Answer the following (3 mark) [03]**
1. Explain G capping and Polyadenylation.
- [D] Answer the following (5 mark) [05]**
1. Write a note on Prokaryotic transcription.

**9 [A] Answer the following (One mark) [04]**

1. \_\_\_\_\_ is the hybrid vector derived from plasmids containing cos site of  $\lambda$  – *phage*.
2. Full form of BACs and YACs is \_\_\_\_\_
3. Western blotting is an immunodetection method working on the principle of Ag-Ab reaction. TRUE/FALSE.
4. The plane of cutting is \_\_\_\_\_, if EcoR1 enzyme is used to cut the DNA at restriction site.

**[B] Answer the following (2 mark) [02]**

1. What is cloning vector?

**[C] Answer the following (3 mark) [03]**

1. Explain homopolymer tailing.

**[D] Answer the following (5 mark) [05]**

1. Write a note on application of genetic engineering.

**10 [A] Answer the following (One mark) [04]**

1. Cosmid is the natural vector. TRUE/FALSE.
2. HIND 3 is type II Restriction enzyme. TRUE/FALSE.
3. PUC is used to construct pBR322. TRUE/FALSE.
4. The Palindromic sequence for Hind III enzyme is \_\_\_\_\_.

**[B] Answer the following (2 mark) [02]**

1. What is Genetic engineering?

**[C] Answer the following (3 mark) [03]**

1. Explain steps of genetic Engineering.

**[D] Answer the following (5 mark) [05]**

1. Write a note on pBR322 and pUC vectors.