

**B.Sc. BOTANY
FIFTH SEMESTER
MOLECULAR BIOLOGY
BSB-502**
[USE OMR FOR OBJECTIVE PART]

2024/11

**SET
A**

Full Marks: 35

Duration: 1.30 hrs.

(Objective)

Marks: 10

1X10=10

Time: 15 min.

Choose the correct answer from the following:

1. The genetic code is described as 'degenerate'. What does this mean?
Each amino acid is coded by only one
a. codon
Codons can code for multiple amino
c. acids
b. Some amino acids are coded by more than one codon
d. The code changes frequently
2. What type of amino acid is Lysine?
a. Non-polar
c. Basic
b. Polar
d. Acidic
3. What type of bond is formed between amino acids during translation?
a. Hydrogen bond
c. Covalent bond
b. Ionic bond
d. Peptide bond
4. Which type of mutation involves the substitution of one nucleotide for another
a. Frameshift mutation
c. Substitution mutation
b. Insertion mutation
d. Deletion mutation
5. How do alkylating agents cause mutations?
a. By forming thymine dimers
c. By intercalating between DNA bases
b. By adding alkyl groups to DNA bases
d. By breaking the DNA strands
6. Which of the following is true about DNA polymerase?
It can synthesize DNA in the 5' to 3' direction
a. direction
It can synthesize mRNA in the 3' to 5' direction
c. direction
b. It can synthesize DNA in the 3' to 5' direction
d. It can synthesize mRNA in the 5' to 3' direction
7. In the presence of lactose, how long does it take for the lac operon to be expressed?
when lactose equals glucose
a. concentration
as long as lactose is more than glucose
c. concentration
b. when glucose is more than lactose concentration
d. as long as lactose is more than galactose concentration
8. Which of the following is a potential consequence of a structural mutation?
a. Altered gene expression
b. Increased genetic diversity

- c. Reduced mutation rate d. Enhanced protein function
9. Which factor is responsible for the translocation of the ribosome along the mRNA?
a. eEF-1 b. eIF-2
c. eEF-2 d. eIF-3
10. Termination of replication is triggered by
a. DNA polymerase b. Topoisomerase II
c. Tus protein d. Rho factor

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(Descriptive)

Time : 1 hrs. 15 min.

Marks : 25

[Answer question no.1 & any two (2) from the rest]

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| 1. Write short notes on any one of the following (a) t-RNA (b) Wobble Hypothesis (c) Genetic code | 5 |
| 2. What are the main types of DNA damage? How does base excision repair (BER) work to correct DNA errors? | 4+6=10 |
| 3. What are the main stages of eukaryotic translation? How does the initiation process of translation occur in eukaryotes. | 3+7=10 |
| 4. Discuss the lac operon concept with illustrations. | 10 |
| 5. Explain the process of DNA replication in Prokaryotes. | 10 |

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