

B.Sc. Semester - 5 (CBCS) Examination
Oct/Nov - 2022 (NEW COURSE)
Molecular Biology and Bio-Engineering(Core)

Time: 2:30 Hours**Marks: 70****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

Q.1(A) Answer the following : (04)

1. The DNA replication in bacteria starts at site.....
2. What was Morgan's conclusion when he carried out experiment on eye color of fruit flies?
3. Which of the following is not a part of a gene?
(a) promoter (b) coding region (c) termination sequence (d) none of these
4. What is the scientific name of plant that Mendel used for working on laws of inheritance?

Q.1(B) Answer in Brief (any one out of two) (03)

1. Why did Morgan select *Drosophila* for experimentations?
2. State characteristics of that DNA that help in making it universal genetic material.

Q.1(C) Write a Note on (any one out of two) (07)

1. Mendel's Law of independent assortment.
2. Initiation of replication in a bacterial cell.

Q.2(A) Answer the following : (04)

1. Write two termination codons.
2. In case of bacteria, the relationship between glucose concentration and cAMP is....
(a) linear (b) inverse (c) independent of each other
(d) depends on other parameters
3. Shine-Dalgarno sequence is characteristic of.....
(a) prokaryotes (b) eukaryotes (c) both (d) none
4. Regulation of *trp* operon in *Escherichia coli* can occur by.....
(a) a repressor (b) attenuation (c) both (d) none

Q.2(B) Answer in Brief (any one out of two) : (03)

1. Explain structure of ribosome of a bacterial cell.
2. Draw characteristic structure of *trp* operon in bacteria.

Q.2(C) Write a Note on (any one out of two)..... (07)

1. Negative control of *lac* operon
2. post translational modifications

Q.3(A) Answer the following : (04)

1. Which of the following represents site-specific recombination?
(a) transformation (b) generalized transduction (c) conjugation (d) lysogeny
2. When the F plasmid carries a portion of chromosomal DNA within it, it is known as.....
3. Whether illegitimate recombination is homologous or non-homologous?
4. Who discovered transposable elements?

Q.3(B) Answer in Brief (any one out of two) : (03)

1. Discuss in brief : Abortive transduction
2. Discuss in brief : general steps of transformation

Q.3(C) Write a Note on (any one out of two)..... (07)

1. Mechanism of conjugation
2. Homologous recombination

- Q.4(A)** Answer the following : (04)
1. Name the test developed based on reversion mutation.
 2. Name two biological mutagens.
 3. Which sequence is important in case of methyl-directed mismatch repair?
 4. Which gene is mainly involved in prion protein mutation?
- Q.4(B)** Answer in Brief (any one out of two) : (03)
1. Distinguish between hypomorphic and hypermorphic mutations.
 2. Explain phenotypic lag.
- Q.4(C)** Write a Note on (any one out of two)..... (07)
1. Excision repair.
 2. Discuss causes of spontaneous mutations
- Q.5(A)** Answer the following : (04)
1. State a disadvantage of an adaptor.
 2. What is the full form of X-Gal?
 3. Which type of restriction enzyme is useful in RDT?
 4. What is a cosmid?
- Q.5(B)** Answer in Brief (any one out of two) : (03)
1. Write characteristics of an ideal vector.
 2. Explain principle of DNA isolation.
- Q.5(C)** Write a Note on (any one out of two) (07)
1. Colony hybridization
 2. cDNA library preparation
