647510 **BSCmbeCC5030** **Seat No :_____**

B.Sc. Semester - 5 (Remedial) (*CBCS*) Examination
February/March. -2020
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.

Que-1 (A) Answer any one of the following: **(07)**

1. Discuss the termination of Replication in Prokaryotes and Eukaryotes.
2. State all the three laws of inheritance proposed by the Mendel. Discuss any one law of inheritance with suitable example.

Que-1 (B) Attempt any one. **(04)**

1. Discuss Griffith's experiment supporting DNA as genetic material.
2. Enlist the name of 4 scientists along with their contribution in the field of Genetics or Molecular biology.

Que-1 (C) Attempt any three. **(03)**

1. What is Test cross in genetics?
2. State the function of Ligase enzyme in DNA replication process.
3. State the contribution of Walter Sutton.
4. State the function of Muton region of the eukaryotic genes.
5. _____ & _____ proved DNA as the genetic material in Varuses.

Que-2 (A) Answer any one of the following. **(07)**

1. Discuss the regulation of gene expression at translation level in prokaryotes with suitable example and neat and labeled diagram.
2. Discuss the process of Prokaryotic Transcription in detail.

Que-2 (B) Attempt any one. **(04)**

1. Discuss the positive and negative regulation of lac open on in brief.
2. Discuss the process of t-RNA activation.

Que-2 (C) Attempt any three. **(03)**

1. Enlist the three Genetic codes for stop codons in RNA.
2. Enlist the composition of 80S ribosome.
3. Enlist the names of post transcriptional modification(s).
4. What is the significance of capping the premature mRNA?
5. Name the enzyme which forms peptide bond between amino acids during translation process.

Que-3 (A) Answer any one of the following. **(07)**

1. Discuss Plasmid mediated horizontal gene transfer in prokaryotes with respect to its mechanism(s) and significance of plasmid.
2. Enlist the types of Recombination. Discuss any one type of recombination in detail with neat and labeled diagram.

Que-3 (B) Attempt any one. **(04)**

1. Discuss the mechanism of competence development during Natural Transformation in detail.
2. Write a detailed note on specialized transduction and state its significance.

Que-3 (C) Attempt any three. **(03)**

1. Define: Prophage.
2. How Hfr cells are different from F^+ cells?
3. Enlist two names of method used for inducing competences in the cell artificially.
4. State the significance of transposable elements.
5. _____ discovered the 1^{st} transposable element.

Que-4 (A) Answer any one of the following. **(07)**

1. Discuss Spontaneous point mutation in detail.
2. State the functioning of Excision and Mismatch repair system.

Que-4 (B) Attempt any one. **(04)**

1. Enlist two names of chemical mutagenic agent. Discuss the mechanism of any one Physical mutagenic agent.
2. Discuss the types of changes that have been observed in the chromosomes.

Que-4 (C) Attempt any three. **(03)**

1. State the function of Lex A protein in SOS repair mechanism.
2. Define: Mutator genes.
3. What changes will be observed in the DNA sequence during frame-shift mutation?
4. Define: Neutral mutation.
5. What is leaky mutation?

Que-5 (A) Answer any one of the following. **(07)**

1. Discuss in brief: Steps involved in Genetic engineering.
2. Discuss Site directed mutagenesis with suitable example.

Que-5 (B) Attempt any one. **(04)**

1. Why pBR322 is used as cloning vector?
2. Enlist names of 2 molecular chaperons. State the basic functions of molecular chaperons (minimum 2).

Que-5 (C) Attempt any three. **(03)**

1. State the significance of Marker gene in the vector.
2. What is the function of att site in Phagmid?
3. What is the function of Linker molecules in Genetic engineering?
4. State the function of Restriction endonucleases enzyme in Genetic engineering.
5. Enlist basic components of BAC.

****