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

B.Sc. Semester - 5 (*CBCS*) Examination
December - 2020 (Old Course)
MOLECULAR BIOLOGY AND BIO- ENGINEERING (CORE)

Time: 1:30 Hours **Marks: 42**

Instructions:

1. Figures to the right indicate marks.
2. There are five questions in the question paper.
3. Answer any three of the following questions.

Q.1(A) Answer any one of the following. (07)

1. Describe in detail the structural aspects of prokaryotic gene.
2. Explain the mechanism of prokaryotic DNA replication.

Q.1(B) Attempt any one of the following. (04)

1. Describe briefly polycistronic and monocistronic mRNA.
2. Write a brief note of Mendel's Law of independent assortment.

Q.1(C) Attempt any three of the following. (03)

1. Define allele.
2. What is cistron?
3. _____ is the major DNA replicative enzyme in prokaryotes. (Fill in the blank)
4. What are Okazaki fragments?
5. Which experiment finally proved DNA is the genetic material?

Q.2(A) Answer any one of the following. (07)

1. Write a descriptive note on operon which is subject to attenuational control.
2. Explain the mechanism of prokaryotic translation process.

Q.2(B) Attempt any one of the following. (04)

1. Write a brief note on termination of the prokaryotic transcription process.
2. Mention the salient features of Universal Genetic Code.

Q.2(C) Attempt any three of the following. (03)

1. Prokaryotes have 70S type of ribosome, which is composed of 60S and 30S subunit. (True or False)
2. Define an operon.
3. State the regulatory elements of a prokaryotic gene.
4. Give example of an operon which is subject to positive and negative control by two different proteins.
5. Enlist the stop codons.

Q.3(A) Answer any one of the following. (07)

1. Explain the mechanism of gene transfer among prokaryotes by conjugation process.
2. Write a detail note on specialized transduction process.

Q.3(B) Attempt any one of the following. (04)

1. What is competence? How the competence can be induced artificially among bacterial population?
2. Mention the significance of homologous recombination in prokaryotes.

Q.3(C) Attempt any three of the following. (03)

1. What is site specific recombination?
2. What are IS elements?
3. What are composite transposons?
4. Which gene transfer mechanism among prokaryotes require direct cell to cell contact?
5. A conjugative plasmid carrying chromosomal genes is called _____. (fill in the blank)

Q.4(A) Answer any one of the following. (07)

1. Describe Mismatch repair and photo reactivation repair mechanisms.
2. Write a descriptive note on various types of mutagens.

Q.4(B) Attempt any one of the following. (04)

1. Mention the biochemical basis of mutation.
2. Write a brief note on Excision repair mechanism.

Q.4(C) Attempt any three of the following. (03)

1. What is induced mutation?
2. UV causes dimerization of adjacent Adenine nucleotides. (True/False)
3. _____ test is used to check the mutagenic behaviour of a chemical. (fill in the blank)
4. What is point mutation?
5. Photoreactivation repair mechanism requires the exposure of bacterial population to visible light after their treatment with UV light. (True/False)

Q.5(A) Answer any one of the following. (07)

1. What are vectors? Describe plasmids as vectors with suitable examples.
2. Describe site directed mutagenesis.

Q.5(B) Attempt any one of the following. (04)

1. Write a brief note on molecular chapersones.
2. Comment on the aims and applications of genetic engineering.

Q.5 (C) Attempt any three of the following. (03)

1. What are cosmids?
2. What is blue-white screening?
3. What is a market gene?
4. Give full form of YAC.
5. Enlist the mechanisms used to introduce vector into the host cells.

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