Progressive Education Society's
Modern College of Arts, Science & Commerce Ganeshkhind, Pune – 16
End Semester Examination
Faculty: Science and Technology

Program: BScGen03 **Semester: IV** **SET: B**
Program (Specific): S.Y.BSc Microbiology **Course Type: DSC**
Class: SYBSc. **Max.Marks: 35**
Name of the Course:Bacterial Genetics
Course Code:23-MB-241 **Time: 2Hr**
Paper: I

Instructions to the candidate:

1) ***There are 4 sections in the question paper. Write each section on separate page.***
2) ***All Sections are compulsory.***
3) ***Figures to the right indicate full marks.***
4) ***Draw a well labelled diagram wherever necessary.***

SECTION: A

Q1) Attempt the following questions **5M**

I) State true or false: Uracil is a purine nitrogen base.

II) Define gene

III) Codons are composed of _____(choose the correct alternative)
   a) Triplet sequences of deoxyribose sugars in DNA.
   b) Triplet sequences of nucleotide bases in t RNA
   c) Triplet sequences of deoxyribose sugars in RNA
   d) Triplet sequences of nucleotide bases in mRNA

IV) Define Transversion mutation.

V) SSB proteins are the proteins which help in_____during DNA replication (choose the correct alternative).
   a) Holding of DNA polymerase on the DNA strands.
   b) Maintaining DNA strands in closed double helix state.
   c) Releasing the extra tension in supercoiled DNA.
   d) Maintaining DNA strands in open single stranded state.

Q2) Answer any <u>four</u> of the following questions **4M**

I) Discuss conservative mode of replication.
II) Enlist any two properties of plasmids.
III) Define Translation.
IV) A genetic code has 64 codons but only 61 codes for specific amino acids, why?
V) Distinguish between B and A form of DNA.
VI) Draw the structure of Adenine.

SECTION: B

Q3) Answer any <u>four</u> of the following questions **8M**

I) Describe temperature sensitive mutations.
II) Compare and contrast Natural mutations and artificial mutations.
III) Justify genetic code is non-overlapping.
IV) Write a note on plasmid replication.
V) Relate anticodon, t-RNA and amino acid .
VI) Discuss Nucleoside, nucleotide and polydeoxyribonuleotide formation.

SECTION: C

Q4) Answer any <u>four</u> of the following questions **8M**

I) Define RNA primer and explain its importance in DNA replication.
II) Illustrate the structure of hydrogen bonding between G and C in double stranded DNA.
III) Diagrammatically illustrate DNA replication.
IV) Discuss plasmid amplification and incompatibility.
V) The process of protein synthesis is taking place in a prokaryotic organism. Answer the following.
   1. Name the type of Ribosome involved with its subunits.
   2. Name the start codon with amino acid specified by it.
   3. Name the start codon and amino acid encoded by it.
VI) Explain Induced mutations.

SECTION: D

Q5) Attempt any <u>two</u> of the following **10M**

I) Define the term base analogue and describe mutations caused by base analogues with suitable examples.

II) State the effect of UV rays as mutagenic agents.

III) You have studied that DNA replicates by semiconservative mode of replication. On this basis answer the following:

1. Name the scientists who experimented using ^{15}N nitrogen to prove semiconservative mode of replication.
2. State the role of origin of replication.
3. Explain the function of helicase enzyme.
4. Name the direction in which new nucleotides are added during replication
5. Significance of Okazaki fragments.

IV) Describe Griffiths experiment of “transforming Principle”.