

Unique Paper Code (UPC) : 32531327
Name of the Paper : Molecular Biology
Name of the Course : B.Sc. (Hons.) Microbiology
Semester : 3
Duration : 4 hours including time taken for downloading question paper and uploading answer sheets
Maximum marks : 75

On first page, please write the following details:

1. Date and time of examination (DD/MM/YYYY, Hours:Min)
2. Examination Roll Number
3. Name of the Program, i.e. B.Sc. (H) Microbiology
4. Semester
5. Unique Paper Code (UPC)
6. Title of the Paper
7. Name of the College
8. Email ID of the student
9. Mobile Number of the student

SET 1

Attempt any **four** questions. **All** questions carry equal marks. Supplement your answers with self-explanatory diagrams/flowcharts. Please answer on A4 size sheets and mark the page number at the top of each page.

Q1. Give the salient features of B-DNA, and its major differences from other types of DNA. What is T_m value of a DNA, and graphically explain various factors which influence the T_m value. How is renaturation of DNA different from denaturation? 7+7+4.75

Q2. Explain the mechanisms by which mitochondria replicate their DNA. What do you understand by processivity of a DNA polymerase and how is it different from proof reading function? List the various DNA polymerases present in prokaryotes and explain their role in DNA replication. 7+5.75+6

Q3. Explain with the help of diagrams how mRNA maturation takes place in eukaryotes. What is an alternative splicing: give any four mechanisms and explain using an example of each. 9+9.75

Q4. Explain the process of translocation in prokaryotic translation? How is the fidelity of translation maintained at various levels of translation in prokaryotes? Name any two protein synthesis inhibitors in prokaryotes and mention their mechanism of action. 8.75+6+4

Q5. Discuss various strategies for the regulation of gene expression in prokaryotes. Illustrate how gene expression is regulated during yeast mating type switching with the help of suitable diagrams, including the various proteins involved in this process. 6.75+12

Q6: How does gene silencing occur in cells with the help of RNA? Explain the molecular mechanism involved in the production of such RNA with the help of a diagram. Briefly mention its biological significance. 18.75