

**PGIVS 1603 A-18**  
**M.Sc. IVth Semester Examination**  
**BIOCHEMISTRY**  
**(Molecular Biology-II)**  
**Paper : HCT- 4.2**

Time : 3 Hours

Maximum Marks : 80

**Instructions to Candidates:**

Answer Question No. 1 and any Four of the remaining.

(10×2=20)

1. Answer the following

- a) Distinguish between Prokaryotic and Eukaryotic promoters.
- b) Give the editing action of RNA.
- c) What is colinearity of genes and proteins?
- d) What are snRNAs? Give their importance.
- e) Write the coding properties of tRNA
- f) Explain the pairing relationship of codon and anticodon
- g) What is Shine-Dalgarno sequence?
- h) Name any two inhibitors and their action of protein translation in prokaryotes.
- i) What is Catabolite repression?
- j) Write the features of Lac repressor protein.

2. a) Explain the mechanism of transcription by RNA polymerase in E.coli.

b) How do you demonstrate the foot print analysis of binding of RNA polymerase on DNA fragment.

c) How is mRNA processed in eukaryotes. (3×5=15)

3. a) Discuss the events taking place during the transcription at RNA polymerase II promoters.

b) Explain the methods employed for deciphering the genetic code.

c) Describe the initiation steps of translation in prokaryotes. (3×5=15)

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4. a) Explain the splicing mechanism of group II Introns.  
b) Give a comparative account on ribosomes of Prokaryotes and Eucaryotes.  
c) Explain the clover leaf secondary structure of tRNA. (3×5=15)
5. a) Describe the positive and negative regulation of lac operon in E.Coli.  
b) How is tryptophan operon regulated.  
c) Explain any two DNA binding domains motifs in eucaryotes. (3×5=15)
6. a) Explain the promoters and their regulatory protein involved in gene aregulation of eucaryotes.  
b) Describe the regulation of gene of galactose metabolism in yeast.  
c) Discuss the distribution of maternal and segmental gene products in drosophila. (3×5=15)
7. Write short notes on any **THREE** of the following (3×5=15)
- a) Genetic code
  - b) Eukaryotic RNA polymerases
  - c) Gene amplification
  - d) Transcriptional termination in eucaryotes.
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**PGIVS 1601 A-18**  
**M.Sc. IV<sup>th</sup> Semester Examination**  
**BIOCHEMISTRY**  
**(Recombinant DNA Technology and Bioinformatics)**  
**Paper : SCT 4.1**

Time : 3 Hours

Maximum Marks : 80

**Instructions to Candidates:**

Answer Question No. 1 and any Four of the remaining.

1. Answer the following questions. (10×2=20)
- a) Distinguish between phagemid and cosmid.
  - b) What is in vitro packaging?
  - c) Write the features of YAC.
  - d) Give the principle and application of western blotting.
  - e) What are transposable genetic elements?
  - f) What are fusion proteins? How are they constructed?
  - g) What is protoplast regeneration?
  - h) Differentiate between cells and cell lines.
  - i) What is proteomic data analysis?
  - j) What are annotated databases?
2. a) Describe the characteristic properties of a suitable cloning vector with an example.  
b) Discuss the characteristics and applications of restriction endonucleases. (7+8=15)
3. a) What is DNA ligation? How are blunt ended DNA molecules modified into sticky ends?  
b) Describe any two methods employed in the introduction of recombinant DNA into prokaryotic hosts. (8+7=15)

4. a) Give an account on use of bacteriophage lambda DNA as a cloning vector.  
b) Explain the role of DNA modifying enzymes.  
c) Write a note on DNA finger printing technique, (3×5=15)
5. a) Discuss any two methods used for screening of libraries for desired genes.  
b) Give an account on use of recombinant molecules as diagnostic probes for genetic diseases.  
c) Explain the generation of transgenic plants and their applications. (3×5=15)
6. a) Give an account of biological databases.  
b) Describe the principle and applications of microarray analysis.  
c) Give an account of database management. (3×5=15)
7. Write short notes on any **THREE** of the following (3×5=15)
- a) cDNA library
  - b) PCR
  - c) Transgenic animals
  - d) Phylogenetic.
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**PGIVS 1602 A-18**  
**M.Sc. IVth Semester Examination**  
**BIOCHEMISTRY**  
**(Molecular Biology-I)**  
**Paper : HCT- 4.1**

Time : 3 Hours

Maximum Marks : 80

**Instructions to Candidates:**

Answer question No. 1 and answer any Four of the remaining.

1. Answer the following questions. (10×2=20)
- a) Write the central dogma of molecular biology.
  - b) What are repetitive sequences? Give its importance.
  - c) State Chargaff's rule.
  - d) What are transposons?
  - e) Give the structure of replication fork.
  - f) What is suppressor sensitive mutation?
  - g) Give the components of uvr complex.
  - h) Give the significance of autonomous replication sequences.
  - i) What is base excision repair?
  - j) Give the role of ubiquitylation in regulation of DNA repair.
2. a) Explain the structure and organization of nucleosomes.  
b) Give an account on tandem gene clusters. (5+5+5=15)  
c) Explain events of conjugation
3. a) Explain Holiday model of recombination.  
b) Give an experiment to determine semi conservative mode of replication. (7+8=15)
4. a) Explain DNA replication in SV40  
b) Give the mechanism of eukaryotic replication. Add a note on DNA fidelity.(7+8=15)

5. a) Discuss different types of mutation.  
b) Describe the effect of uv radiation on replicating and resting DNA. (7+8=15)
6. a) Describe SOS repair system in bacteria.  
b) Explain chromatin remodeling.  
c) Give an account on inhibitors of DNA replication. (5+5+5=15)
7. Write short notes on any **THREE** of the following (3×5=15)  
a) Lampbrush and polytene chromosomes.  
b) Rolling circle mode of replication  
c) Site directed mutagenesis and its application.  
d) Xeroderma pigmentosum.