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PGIVS 1589 A-16
M.Sc. IVth Semester Degree Examination
Biochemistry
(Molecular Biology - I)
Paper : HCT - 4.1

Time : 3 Hours Maximum Marks : 80

Instructions to Candidates:

Answer quetion No. 1 and any four of the remaining.

1. Answer the following : **(2×10=20)**

a) Depict central dogma of molecular biology.

b) Give biochemical significance of chromosomal puffing.

c) Differentiate between insertions sequence and composite transposon.

d) Mention role of telomeres.

e) Define the terms 'Mutagen' and 'Mutation'.

f) How is thymine dimer formed in DNA?

g) Mention role of Rec BCD complex.

h) How is Aem's test performed?

i) What are okazaki fragments?

j) What is primosome complex?

2. a) Explain experimental evidence which proves DNA to be a genetic material.

b) Discuss structure and organization of nucleosome. **(7+8=15)**

3. a) What are plasmids? Give an account on their structure and functions.

b) Explain genetic mapping of bacterial chromosome by interrupted mating. **(7+8=15)**

4. a) Discuss experimental evidence to prove that DNA replicates by semi - conservative mode of replication.

   b) Describe elongation and termination steps in DNA replications. **(7+8=15)**

5. a) Explain Lederberg's replica plating technique.

   b) What is site directed mutagenesis? Mention its applications. **(7+8=15)**

6. a) Give components and functions of E. coli replication fork.

   b) Discuss biochemical mechanism for repair of thymine dimer. **(7+8=15)**

7. Write notes on any **three** of the following : **(3×5=15)**

   a) Holiday model of recombination.

   b) Inhibitors of DNA replications.

   c) Histone genes.

   d) Xeroderma pigmentosum.

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PGIVS 1590 A-16
M.Sc. IVth Semester Degree Examination
Biochemistry
(Molecular Biology - II)
Paper : HCT 4.2

Time : 3 Hours Maximum Marks : 80

Instructions to Candidates:

Answer quetion ***No. 1 and any four*** *of the remaining.*

1. Answer the following : **(2×10=20)**

a) What is sigma switching? Give its significance.

b) Give the components of basal transcription apparatus.

c) What are codon families and pairs? Give examples.

d) What is RNA interference? Give its applications.

e) Define coding property of tRNA.

f) Give the experimental proof for direction of protein synthesis.

g) How does constitutive gene expression differ from induced expression?

h) Define catabolite repression. Name any two catabolite sensitive operons.

i) What do you mean by modular construction of transcription activators?

j) Name the gene products which help in utilization of galactose in yeast.

2. a) Outline the events of formation of pre - initiation complex at prokaryotic promoter.

b) Describe splicing by group - I introns.

c) Explain how is the colinearity of genes and proteins proved. **(3×5=15)**

3. a) Distinguish between promoters and enhancers.

b) Explain translational control of gene expression with an example. **(8+7=15)**

4. a) Discuss positive and negative regulation of lac operon.

   b) Give the general features of genetic code. Comment on works of Dr. Khorana.

(8+7=15)

5. a) Discuss post transcriptional modification of eukaryotic mRNA.

   b) Explain the chemical and physical changes caused by chromatin remodeling.

(8+7=15)

6. a) Explain how bands and inter - band boundaries are defined in Drosophila melanogaster embryo.

   b) Discuss organization, properties of various DNA binding motifs of transcription activators. (7+8=15)

7. Write notes on any **three** of the following : (3×5=15)

   a) Mitochondrial DNA replication

   b) Post transcriptional modification of mRNA.

   c) Nearest neighbor frequency analysis

   d) Origin of replication.

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PGIVS 1591 A-16
M.Sc. IVth Semester Degree Examination
Biochemistry
(Biotechnology 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 : **(10×2=20)**

a) Distinguish between cosmids and phagemids.

b) What are YAC vectors?

c) What is in vitro packaging?

d) What is DNA finger printing?

e) What are fusion proteins?

f) What is microarray?

g) Give any one method used for gene transfer in mammalian cells

h) What is Ti plasmid?

i) What is multiple sequence analysis?

j) What is gene therapy?

2. a) Discuss the characteristics and applications of restriction endonucleases.

b) Describe the characteristics of pBR 322 as an ideal vector.

c) How is bacteriophage lambda DNA used as a cloning vector. **(5+5+5=15)**

3. a) Describe any two methods employed in the transfer of recombinant DNA.

b) What is DNA ligation? Discuss the mechanism of ligation.

c) Give an account on reparation of cDNA. **(5+5+5=15)**

4. a) What is in situ hybridization? Explain its application.

   b) Discuss the principle and applications of PCR.

   c) Write a note on generation of transgenic plants and their applications in agriculture. **(5+5+5=15)**

5. a) Discuss the medicinal applications of recombinant DNA technology.

   b) Describe the use of transgenic animals as models for human genetic diseases.

   c) Explain protoplast regeneration **(6+5+4=15)**

6. a) Describe various biological data bases.

   b) Write an account of retrieval and analysis of biological data. **(7+8=15)**

7. Write short notes on any **three** of the following : **(3×5=15)**

   a) Southern blotting

   b) Chromosomal walking

   c) Expression vectors

   d) Proteomic data analysis.