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PG4S-010-B-23

M.Sc. IV Semester (CBCS) Degree 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.

Answer any Ten of the following.

(10×2=20)

1.
 - a) What are dideoxynucleotides? Mention their applications.
 - b) What is terminal deoxynucleotidyl transferase?
 - c) Give the classification of nucleases giving an example each.
 - d) Draw a neat diagram of pBR322.
 - e) What are palindromes? Give example.
 - f) What are Isoschizomer and Neoschizomers?
 - g) What is insertional inactivation? Give example.
 - h) What are fusion proteins? Give example.
 - i) What is GFP? Mention its application.
 - j) Elaborate the terms DDBJ, NCBI, EMBL and SWISSPORT?
 - k) What is Entrez?
 - l) What does sequence alignment reveals?

2.
 - a) Discuss the properties and functions of plasmid vectors used in genetic engineering.
 - b) Write the classification of restriction endonucleases and add a note on the applications of class II RE. **(8+7=15)**

3.
 - a) Discuss gene cloning in *-vitro*.
 - b) Discuss the methods of introduction of rDNA in to host cell. **(8+7=15)**

4. a) Explain the process of *Agrobacterium* mediated gene transfer in plants.
b) Describe site-directed mutagenesis and its applications. (8+7=15)
5. a) Discuss various types of PCR. Give their applications.
b) Describe the Western blotting technique. Mention its applications. (8+7=15)
6. a) Discuss the methods used to construct the phylogetic tree.
b) Explain the 2D PAGE and mention its applications. (8+7=15)

Write notes on any Three of the following.

(3×5=15)

7. a) Transgenic animals
b) Blue-White screening
c) Application of rDNA technology
d) Microarray analysis
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PG4S-009-B-23

M.Sc. IV Semester (CBCS) Degree 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.

Answer any Ten of the following.**(10×2=20)**

1.
 - a) What is promoter sequence? Write the structure of prokaryotic gene.
 - b) What is RNA editing?
 - c) What is reverse transcription?
 - d) Write the properties of tRNA.
 - e) How amino acids are activated during translation?
 - f) List out the inhibitors of eukaryotic translation.
 - g) How are membrane proteins synthesised?
 - h) What are extra and intra cellular signals?
 - i) What is catabolite repression?
 - j) What is Zing finger protein? List their functions.
 - k) What is helix-loop-helix motif? Give its importance.
 - l) What are eukaryotic regulatory proteins?

2.
 - a) Describe the structure and function of prokaryotic RNA polymerase.
 - b) Explain the mechanism of elongation and termination of prokaryotic transcription.
 - c) Discuss the role of various transcriptional factors of class II genes. **(3×5=15)**

3.
 - a) Explain the post-transcriptional processing of mRNA and rRNA.
 - b) What were the key discoveries makes RNA is useful tool?
 - c) Describe the general features of genetic code. **(3×5=15)**

4.
 - a) Explain the regulation of Lactose operon.
 - b) How do you prove that the protein biosynthesis occurs from N to C-terminal?
 - c) Discuss the contributions of Nirenberg and Khorana. **(3×5=15)**

5. a) Discuss the exchange of ribosomal sub units during translation.
b) Explain the initiation and elongation steps in prokaryotic translation.
c) How proteins are destined to their targets? (3×5=15)

6. a) Discuss the posttranslational modification of proteins in prokaryotes.
b) Explain the regulation of galactose metabolism in *Saccharomyces cerevisiae*.
c) Outline the process of chromatin modification. (3×5=15)

Write notes on any Three of the following.

(3×5=15)

7. a) Wobble hypothesis
b) Tryptophan operon
c) Gene amplification
d) Hormonal regulation of gene expression
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