Reg. No : | | | | | | | | | | | | |

Question Paper Code:U5C01

B.E./B.Tech. DEGREE EXAMINATION, NOV 2024

Fifth Semester

BIOTECHNOLOGY

21UBT501 MOLECULAR BIOLOGY

(Regulation 2021)

Duration: Three hours | Maximum: 100 Marks

PART A - (10 x 2 = 20 Marks)

1.	Give the significance of phospho diester bond.	CO1-U
2.	What is Hogsteen Base pairing?	CO1-U
3.	What do you mean by semi conservative replication? How it differs from conservative replication?	CO1-U
4.	The synthesis of Okazaki fragments is a key elements in *E.coli* replication. Each Okazaki fragment is initiated by an RNA primer. How are they removed from the Okazaki fragment?	CO2-APP
5.	Add a note on core enzyme and holo enzyme of E.coli RNA polymerase	CO1-U
6.	Distinguish between prokaryotic and eukaryotic transcription process.	CO2-APP
7.	Give the triplet sequence of Start codon and the amino acid it specifies and name one stop codon?	CO1-U
8.	What are translation inhibitors? Give one example and its mechanism.	CO1-U
9.	List three mechanisms a bacterial cell uses to control the amount of protein present inside the cell.	CO1-U
10.	Why attenuation does not occur in eukaryotes?	CO1-U

PART – B (5 x 16= 80 Marks)

11.	(a)	Outline the structure and functions of DNA. Classify and explain the variants of double helical DNA.	CO1-U	(16)
		Or		
	(b)	How RNA structurally different from DNA? Explain the functions of RNA in protein synthesis.	CO1-U	(16)

12. (a) DNA replication is bidirectional and discontinuous; outline your understanding of those concepts by describing the events that happen during DNA Replication in *E.coli* with proper illustration. CO2-App (16)

Or

(b) An adult with a history of tanning has his genome sequenced. The beginning of a protein-coding region of his DNA reads ATGGGGATATGGCAT. If the protein-coding region of a healthy adult reads ATGGGGATATGAGCAT, identify the site and type of mutation.How the following mechanisms help in repairing the above error prone DNA after Replication process CO2-App (16)

i. Nucleotide excision repair

ii. Recombination Repair

13. (a) Give a detailed account on prokaryotic tRNA and rRNA processing. How do rRNA and tRNA work together in the after processing of transcription process? CO3-App (16)

Or

(b) Enhancers are regions in eukaryotic cells, how they are considered necessary for transcription. Also describe the role of other Regulators and transcription factors in eukaryotic transcription. CO3-App (16)

14. (a) "Proteolytic modifications of the polypeptide are an important process in the mechanism for protein sorting and transport". CO4-Ana (16)

How can you justify this statement? Write a case study on this concept and its consequences in Alzeimers disease.

Or

(b) What is the concept of genetic code, explain using Wobble hypothesis? Is genetic code universal or not, justify your statement CO4-Ana (16)

15. (a) Relate the structural genes and enzymes present in the process of Operon concept. How these enzymes are involved in metabolism of lactose in the cell. CO5-Ana (16)

Or

(b) What are the 5 structural genes of Trp Operon? Tryptophan is externally supplied to E.coli then, Trp Operon is swithed OFF. How can you support this statement? CO5-Ana (16)