

Enrollment No:

Exam Seat No:

C.U.SHAH UNIVERSITY

Summer Examination-2018

Subject Name: Molecular Biology

Subject Code: 4SC02MOB1

Branch: B.Sc (All)

Semester: 2

Date: 04/05/2018

Time: 10:30 To 01:30

Marks: 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

Q-1 Attempt the following questions: (14)

- a) What is the role of sigma factor in transcription?
- b) Define genome
- c) Define origin of replication
- d) Name the enzyme that helps in synthesis of DNA from RNA.
- e) What is TATA box?
- f) What is the role DNA topoisomerase?
- g) Define Promoter
- h) What is the role of rRNA in translation
- i) Name the different subunits of prokaryotic ribosome
- j) What are three major requirements of replication?
- k) Define Transcription factors
- l) Name the four different nucleotides
- m) Name the three Termination codons in Translation
- n) Define Okazaki fragments

Attempt any four questions from Q-2 to Q-8

Q-2 Attempt all questions (14)

- a) Give the composition of ribosomes in bacterial and eukaryotic cells. Draw a comparative chart for it. (7)
- b) Explain the enzymology of DNA replication? (4)
- c) The following base sequence represents part of the transcribing strand of DNA
5'TACCATGGGCC.3'
 - i) Give the orientation and base sequence of the complementary strand.
 - ii) Give the orientation and base sequence of the RNA that is synthesized from it. (3)

Q-3 Attempt all questions (14)

- a) Explain post transcriptional modification of eukaryotic mRNA? (7)
- b) Describe the structure of t-RNA. What is its role in translation? (4)



	c) What is the significance of the T_m (melting temperature) of DNA?	(3)
Q-4	Attempt all questions	(14)
a)	Distinguish between:	(7)
	i) Operator and Promoter	
	ii) Leading strand and Lagging strand	
	iii) Intron and Exon	
b)	Briefly explain different steps in prokaryotic and eukaryotic transcription?	(4)
c)	Give three structural features of the B-form of the DNA double helix	(3)
Q-5	Attempt all questions	(14)
a)	What does it mean that replication is semi-conservative? Explain.	(7)
b)	A certain mRNA codon is determined to be AUG.	(4)
	i) What is the anticodon in the tRNA?	
	ii) What sequence of DNA is responsible for the mRNA codon?	
	iii) AUG codon codes for which amino acid?	
c)	What is meant by repression and derepression of gene expression? Give examples in support of your answer	(3)
Q-6	Attempt all questions	(14)
a)	Describe the series of events that occur in a bacterial cell following the addition of lactose	(7)
b)	What is mRNA splicing? Explain its mechanism in detail with the help of a diagram	(4)
c)	Compare and contrast the structure of B-DNA with that of Z-DNA.	(3)
Q-7	Attempt all questions	(14)
a)	Write a note on Organelle DNA	(7)
b)	Briefly describe initiation and termination of protein synthesis in prokaryotes	(4)
c)	What is RNA interference? Explain its role in gene expression.	(3)
Q-8	Attempt all questions	(14)
a)	Give a brief account of mechanism of action of Telomerase and explain the importance of telomerase in human biology	(7)
b)	Outline the causes of DNA damage and give a brief account of DNA repair system.	(4)
c)	What is genetic code? Discuss the characteristics of genetic code	(3)

