

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.
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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 (3)
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.

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 prokarotes (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)

