

(20)

SARDAR PATEL UNIVERSITY
M. Sc. Biotechnology Ist Semester Examination
PS01CBIT01: Molecular Biology
Saturday, 18/04/2015

Time: 10: 30 a.m. to 1:30 p.m.

Max. Marks: 70

Note: Figures on the right indicate marks.

- Q.1 Choose the most appropriate answer (08)
- i Shine Dalgarno sequence found in the prokaryotic mRNA facilitates ribosome binding by its interaction with 3' end of the
 a) 5S rRNA b) 16S rRNA c) 23S rRNA d) 18S rRNA
 - ii Which of the following is most heat stable?
 a) protein b) DNA c) mRNA d) tRNA
 - iii Promoter elements in prokaryotes usually possess consensus sequences at
 a) -10 and -35 b) -10 and -60 c) -10 and -25 d) -25 and -110
 - iv 'cap' is a structural feature of the following eukaryotic nucleic acid molecules
 a) tRNA b) DNA c) mRNA d) rRNA
 - v The cloverleaf model represents the secondary structure of
 a) telomeres b) mRNA c) rRNA d) tRNA
 - vi Which of the following represents Watson and Crick base pair?
 a) G-U b) A-T c) G-C d) both 'b' and 'c'
 - vii Which of the following is involved in initiation of DNA replication in *E. coli*?
 a) Dna A b) DNA Pol I c) DNA Pol II d) DNA ligase
 - viii The ds DNA would get denatured at room temperature in presence of
 a) glucose b) helix destabilizing protein c) water d) peptone
- Q.2 Attempt any SEVEN of the following (14)
- a) What is second genetic code?
 - b) Differentiate conserved sequences from consensus sequences.
 - c) Write the components of 70S ribosome.
 - d) Explain the role of σ^{70} factor in transcription.
 - e) Briefly explain alternative splicing.
 - f) What are polysomes?
 - g) Explain alternative splicing in brief.
 - h) Explain the role of DNA helicase in DNA replication.
 - i) Explain the term superhelical density of DNA in brief.

- Q.3 a. Explain in detail the initiation of transcription in eukaryotes. (06)
- b. Write general features of genetic code and point out exceptions wherever they exist. (06)
- OR
- b. Explain the methodology employed in determining promoter region of a gene. (06)
- Q.4 a. Explain attenuation regulation of gene expression with trp operon (06)
- b. Write a note on heat shock regulon (06)
- OR
- b. Write a note on capping and polyadenylation of mRNA in eukaryotes (06)
- Q.5 a. Write a note on: B-form of DNA (06)
- b. Discuss different forces influencing stability of native structure of ds DNA. (06)
- OR
- b. Describe salient features of Helix-turn-helix and Leucine zipper DNA binding motifs (06)
- Q.6 a. Describe initiation of DNA replication in *E. coli*. (06)
- b. Write a note on: Nucleosome (06)
- OR
- b. Write a note on: End –replication problem in linear ds DNA (06)