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() SARDAR PATEL UNIVERSITY
M. Sc. Integrated Biotechnology, Fourth Semester Examination
Day and Date: Thursday, 07-04-2016
Time: 10:30 am to 1:30 pm
Paper Code and Subject: PS04CIGB05, Molecular Biology-II

Total Marks: 70

Q-1 Multiple choice questions (All are compulsory).

[08]

- (1) Why is an AT rich region part of the *E. coli* oriC?
a) DnaA proteins bind to AT rich sites b) DnaC proteins bind to AT rich sites
c) AT base pairs are more easily separated than GC base pairs
d) AT base pairs contain more hydrogen bonds than GC base pairs
- (2) Which is a correct description of the replisome?
a) is a complex of several proteins b) includes DNA polymerase, DNA helicase, and primase
c) found at the replication fork during DNA synthesis d) All of these are correct
- (3) A "TATA box" is
a) translation termination sequence b) important base sequence in the promoters of bacteria
c) the site where the RNA polymerase II binding complex is assembled
d) an example of one of the translation stop codons
- (4) The function of beta (β) subunit in RNA polymerase is
a) Promoter binding b) Nucleotide binding c) Template binding d) None of these
- (5) In terms of lac operon regulation, what happens when *E. coli* is grown in medium containing both glucose and lactose?
a) Both CAP and the lac repressor are bound to the DNA
b) CAP is bound to the DNA but the lac repressor is not
c) Lac repressor is bound to the DNA but CAP is not
d) Neither CAP nor the lac repressor are bound to the DNA
- (6) In the function of trp operon in *E. coli* the transcription is attenuated by forming a hairpin loop between region
a) one and two b) two and three c) three and four d) one and four
- (7) DNA repair mechanism is absent in
a) nuclear genome b) mitochondrial genome c) Chloroplast genome d) both b and c
- (8) Dimer repair mechanism include
a) Excision repair b) photoreactivation c) DNA glycosylase d) All of these

Q-2 Answer the following questions in short. (Any Seven)

[14]

- (1) Write a note on klenow fragment.
- (2) What do you mean by dispersive mode of DNA replication?
- (3) Write a note on bidirectional mode of DNA replication.
- (4) Write a note on promoter region.
- (5) Write a short note on single stranded binding protein (SSBP).
- (6) Write a note on structural gene.
- (7) Write a note on Photolyase enzymes.
- (8) Write a note on chromosomal mutation.
- (9) Write a note on Transposon.

- Q-3 (A) Discuss the importance of N^{15} , N^{14} and Cscl (cesium chloride) and its uses to prove [06]
semiconservative mode of DNA replication.
(B) Write the subunits name of DNA polymerase III and its uses in synthesis of leading and [06]
lagging strand.

OR

- (B) Explain the mechanism of Tus-ter mediated termination of DNA replication with suitable [06]
diagram.
Q-4 (A) Explain how the formation of hair pin secondary structure is involved in termination of [06]
transcription.
(B) Discuss the importance of -35 and -10bp consensus sequences and mechanism of [06]
transcription initiation in detail.

OR

- (B) Discuss Inch-worm model for elongation of transcription. [06]
Q-5 (A) What do you mean by charging of tRNA and Explain the process of Initiation for translation? [06]
(B) Discuss EF-Tu-EF-Ts and EF-G cycle in details. [06]

OR

- (B) Discuss the detail mechanism of RF1, RF2 and RF3 in termination of translation. [06]
Q-6 (A) Explain the mechanism of tryptophan (trp) operon. [06]
(B) Discuss the mechanism of Nucleotide excision repair (NER) and mismatch repair in detail. [06]

OR

- (B) Discuss Mutagens in detail. [06]

****Best of luck*****