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[A-28]

SARDAR PATEL UNIVERSITY
M. Sc. Integrated Biotechnology, Fourth Semester Examination
Date: Thursday, 30-04-2015
Time: 2:30 pm to 5:30 pm
Paper Code and Subject: PS04CIGB05, Molecular Biology-II

Total Marks: 70

Q-1 Multiple choice questions (**All are compulsory**). [08]

- (1) Since the first nucleotides cannot be linked in a newly synthesized strand in DNA replication, _____ is required.
a) DNA primer b) DNA polymerase c) ligase d) an RNA primer
- (2) In vivo synthesis of DNA is _____
a) 3' to 5' b) 5' to 3' c) both 3' to 5' and 5' to 3' d) neither 3' to 5' nor 5' to 3'
- (3) Sigma factor is component of
a) DNA ligase b) DNA polymerase c) RNA polymerase d) endonuclease
- (4) The DNA chain acting as template for RNA synthesis has the following order of bases, AGCTTCGA. What will be the order of bases in mRNA?
a) TCGAAGCT b) UGCUAGCT c) TCGAUCGU d) UCGAAGCU
- (5) Translation begins
a) at the replication fork b) on the lagging strand c) at the start codon d) in nucleus
- (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) Thymine dimers are often corrected by light induced repair mechanism. The enzyme involved in the process is
a) photolyase b) photoligase c) DNA glycosylase d) All of these
- (8) Dimer repair mechanism include
a) Excision repair b) Photoreactivation c) Recombinational repair d) All of these

Q-2 Answer the following questions in short. (**Any Seven**) [14]

- (1) Write a note on DNA topoisomerase IV.
- (2) Write a note on concept of Unidirectional and Bidirectional replication.
- (3) Differentiate between replication and transcription.
- (4) Pictorial presentation of Rolling circle mechanism.
- (5) Write a note on upstream and downstream region.
- (6) Write a note on concept of gene.
- (7) Write a note on operator region.
- (8) What do you mean by Retro transposons?
- (9) Write a note on frame shift mutation.

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Q-3 (A) Discuss the experimental approach to prove semiconservative mode of replication utilizing N^{15} , N^{14} and Cscl. [06]

(B) Write the name of different enzymes and proteins involved in initiation of prokaryotic DNA replication with detailed mechanism. [06]

OR

(B) Discuss the mechanism of termination along with the different check point in prokaryotic DNA replication. [06]

Q-4 (A) Explain the importance of TATA and GC box along with the initiation process in prokaryotic DNA transcription. [06]

(B) Discuss Inch-worm model for elongation of transcription. [06]

OR

(B) Explain the importance of hairpin loop structure formation and its involvement in termination of transcription in detail. [06]

Q-5 (A) Explain the mechanism of charging of tRNA and the involvement of IF1, IF2 and IF3 in initiation of translation process. [06]

(B) Show the diagrammatic representation of prokaryotic Elongation of translation with brief discussion. [06]

OR

(B) Enlist the name of Antibiotic's which inhibit the translation process along with the role of RF1 and RF2 in translation process. [06]

Q-6 (A) Discuss the mechanism of positive regulation with example in detail. [06]

(B) Explain the mechanism of photoreactivation and base excision repair mechanism. [06]

OR

(B) Explain a technique for detection of mutation and discuss chemical mutagen. [06]

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