

(42) SARDAR PATEL UNIVERSITY

M.Sc. (BIOINFORMATICS)

SEMESTER - I External Examination

PS01CMBI02: Molecular Biology and rDNA technology

Wednesday, 5th December 2012

Time: 10:30 am to 01:30 pm

Max Marks: 70

Q1. Choose the most appropriate option for each question. [8]

a. The core histones share a common structural fold and the histone fold is composed of:

- A) 4 α helix separated by loops B) 2 α helix separated by loops
C) 3 α helix separated by sheet D) 3 α helix separated by loops
E) None of Above

b. The large subunit of eukaryotic ribosome is composed of.

- A) 16S rRNA B) Decoding center
C) 18S rRNA D) Peptidyl transferase center
E) None of Above

c. Metaphase Chromosome is also called as _____.

- A) 1000nm fiber B) 300nm fiber
C) 1400nm fiber D) 700nm fiber
E) None of Above

d. The DNA most tightly associated with the nucleosome is wound approximately _____ times around the outside of the histone octamer like thread around a spool.

- A) 1.55 B) 1.65
C) 1.45 D) 1.50
E) None of Above

e. Which phosphoryl group of the incoming nucleoside triphosphate is attacked by the hydroxyl group of the 3' end of the primer in DNA synthesis?

- A) α B) β
C) λ D) γ
E) None of Above

f. In DNA replication primase is activated only when it associates with.

- A) DNA ligase
- B) DNA replicase
- C) RNase H
- D) DNA helicase
- E) None of Above

g. Extension of which end of the telomere by telomerase solves the end replication problem?

- A) 5'
- B) 2'
- C) 3'
- D) 5' & 3'
- E) None of Above

h. Gre factors serves as

- A) Hydrolytic editing stimulator
- B) Hydrolytic editing enhancer
- C) Elongation stimulating factor
- D) All of above
- E) None of Above

Q2. Answer the questions (Any seven):

[14]

- a. Describe 30-nm chromatin fiber structure of DNA.
- b. Explain how loading and removing of sliding clamp to/from the DNA is controlled during replication.
- c. The structure and formation of the 5' RNA cap.
- d. With the help of schematic diagram show the relative positions of the DNA strands, regions of σ factor and different channels into and out of the open complex.
- e. Show hydrogen bonding between A : T with the help of schematic diagram.
- f. Explain importance of isoaccepting tRNAs during the process of translation.
- g. Second genetic code.
- h. Describe the structure and the functions of all DNA polymerase domains.
- i. Discuss isoelectric focusing technique for protein purification.
- j. Describe spliceosome machinery and role of any two units in splicing reactions.

Q3.

- a. Explain atomic structure of eukaryotic Nucleosome. [6]
- b. Define translation coupling. List four primary components responsible for translating the language of mRNAs into the language of proteins and discuss about mRNA structure in detail. [6]

OR

