

[10-A]

SEAT No. \_\_\_\_\_

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SARDAR PATEL UNIVERSITY  
B.Sc. V Semester Examination

5/4/2019 Friday  
10:00 am to 1:00 pm

Biotechnology: US05CBIT01

Molecular Biology

Total Marks: 70

[10]

Q.1 Multiple Choice Questions.

- i) \_\_\_\_\_ are hotspots for spontaneous mutations in vertebrate DNA.  
a) Methylated cytosine                      c) Methylated guanine  
b) Methylated adenine                      d) Methylated thymine
- ii) Xeroderma pigmentosum in human is associated with a mutation in \_\_\_\_\_.  
a) Base excision repair                      c) Nucleotide excision repair  
b) Photo reactivation                      d) Mismatch repair
- iii) 5-bromouracil is an analog of \_\_\_\_\_.  
a) Thymine                                      c) Cytosine  
b) Guanine                                      d) Adenine.
- iv) Eukaryotic RNA polymerase-I is specialized to transcribe \_\_\_\_\_.  
a) tRNA    c) rRNA  
b) mRNA    d) Mitochondrial RNA.
- v) What is added to the 3' end of many eukaryotic tRNAs after transcription?  
a) Tri-nucleotides CCA                      c) Introns  
b) Poly A tail                                      d) Cap of modified G nucleotide
- vi) In eukaryotic translation is initiated by binding of ribosome to the \_\_\_\_\_.  
a) Poly A tail                                      c) 5' cap  
b) TATA box                                      d) Pribnows box
- vii) Which of the following statements regarding splicing of eukaryotic mRNA transcripts is correct?  
a) Several reactions in the splicing process involved hydrolysis of ATP.  
b) Exons are splice out and introns are retained in mature mRNA.  
c) Small nuclear RNAs are retained in the mature mRNAs.  
d) Splicing take place in cytosol.
- viii) Secretory proteins are synthesized by \_\_\_\_\_.  
a) Free ribosomes                                  c) Ribosomes on endoplasmic reticulum  
b) Ribosome on nuclear membrane      d) All of the above.
- ix) Which of the following functions is not performed by transposase?  
a) Formation of the RNA intermediate.  
b) Restriction of the IS elements.  
c) Integration of the transposon.  
d) Restriction of the host genome.
- x) LINE and SINE are examples of \_\_\_\_\_.  
a) LTR transposons                              c) Non-LTR transposons  
b) Composite transposons                      d) Ac-Ds elements.

①

P.T.O.

**Q.2 Answer the following questions in short. (Attempt any 10)**

**[20]**

- i) Write the role of cdk in eukaryotic replication.
- ii) Define: transition mutation and transversion mutation.
- iii) Write the role of photolyase and methyl transferase enzymes in direct repair system.
- iv) Give a brief note on core promoter.
- v) Give various functions of RNA polymerase.
- vi) Define RNA splicing.
- vii) Write about methylation of amino acid with its significance.
- viii) What do you mean by SRP? Write its functions.
- ix) Define translocation.
- x) Define transposons and transposition.
- xi) Write an importance of target site in transposition.
- xii) "Transposons exist as both autonomous and non autonomous elements" justify the above statement.

**Q.3 a) Write a detail note on initiation of eukaryotic replication? How it is controlled?**

**[06]**

**b) What is SOS response? Explain in detail.**

**[04]**

**OR**

**Q.3 a) Discuss in detail- DNA damage caused due to hydrolysis, deamination and radiations.**

**[06]**

**b) Give an account on Nucleotide excision repair system.**

**[04]**

**Q.4 Describe the process of transcription in eukaryotes.**

**[10]**

**OR**

**Q.4 a) Write about the mechanism of splicing by spliceosome machinery.**

**[06]**

**b) Explain 5' and 3' modifications in detail.**

**[04]**

**Q.5 Explain diagrammatically the process of elongation and termination of eukaryotic translation**

**[10]**

**OR**

**Q.5 a) Describe any four methods for post translation modification of nascent proteins.**

**[06]**

**b) Give an account on protein targeting in endoplasmic reticulum and nucleus.**

**[04]**

**Q.6 a) Explain in detail- transposable elements in maize.**

**[05]**

**b) What do you mean by LINE and SINE? - discuss in detail.**

**[05]**

**OR**

**Q.6 a) Write a short note on "transposition by a reverse splicing mechanism"**

**[06]**

**b) Write applications of transposons in rDNA technology.**

**[04]**

