

**M. Sc. (Biotechnology) Sem-II (2012 Course)(Choice Based Credit System) : SUMMER - 2019**

**SUBJECT: MOLECULAR BIOLOGY**

Day: Wednesday  
Date: 03/04/2019

**S-2019-1409**

Time: 02.00 PM TO 05.00 PM  
Max Marks. 60

**N.B. :**

- 1) **Q. No.1 and Q. No.5 are COMPULSORY.** Attempt **ANY TWO** from Q. No. 2, 3 and 4 and from Q. No.6, 7 and 8.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw suitable diagrams **WHEREVER** necessary.
- 4) Answers should be written in **SAME** answer book.

**SECTION-I**

- Q.1** Answer **ANY FIVE** of the following in brief. **(10)**
- a) Define linking number of DNA.
  - b) What are retroelements?
  - c) What is a Klenow fragment?
  - d) State the role of DNA polymerase  $\alpha$  in DNA replication.
  - e) Define 'Upstream' and 'Downstream' sequences.
  - f) What is an intrinsic terminator?
- Q.2**
- a) Explain the structure and role of centromere. **(05)**
  - b) With the help of suitable diagrams describe the structure and organization of nucleosome. **(05)**
- Q.3**
- a) Explain the structure of DNA polymerase holoenzyme in *E. coli* and state the role of its each subunit. **(05)**
  - b) What is the effect of UV radiation on DNA? State the role of DNA polymerase IV and V in its repair. **(05)**
- Q.4** Write short notes on (**ANY TWO**): **(10)**
- a) DNA Proofreading
  - b) Recombination repair
  - c) SOS response

**SECTION-II**

- Q.5** Attempt **ANY TWO** of the following. **(10)**
- a) Describe the important features of typical bacterial promoter. How do they initiate transcription?
  - b) Justify the role of universal factor TBP in initiation of eukaryotic transcription.
  - c) Give the role of TFIID, TFIIF, TFIIE and TFIIH in initiation of mRNA synthesis.
- Q.6**
- a) What is GU-AG rule? Outline the steps involved in splicing of introns by lariat formation. **(05)**
  - b) What is Rho factor? What is its role? **(05)**
- Q.7**
- a) Describe the attenuation mechanism of gene regulation giving example of tryptophan operon. **(05)**
  - b) Define the terms: **(05)**  
i) Inducer ii) Operator iii) Repressor iv) Enhancer v) Activator
- Q.8** State the role of following in synthesis of proteins. **(10)**
- a) Shine – Dalgarno Sequence
  - b) IF3
  - c) f-Met tRNA
  - d) EFTu
  - e) Release factors