

**M. SC. (BIOTECHNOLOGY) SEM-II (2012
COURSE)(CHOICE BASED CREDIT SYSTEM) : SUMMER
2018**

SUBJECT: MOLECULAR BIOLOGY

Day : **Saturday**
Date : **07/04/2018**

Time **02.00 PM TO 05.00 PM**
Max. Marks : 60

S-2018-1083

N.B.

- 1) Q.1 and Q.5 are **COMPULSORY**. Out of the remaining, attempt any **TWO** questions from Section – I and Section – II.
- 2) Figures to the right indicate **FULL** marks
- 3) Answers to the both the sections should be written in **SEPARATE** answer book.

SECTION – I

- Q.1** Attempt any **FIVE** of the following: **(10)**
- a) State the contribution of Dr. Har Gobind Khurana in molecular biology.
 - b) What is melting temperature (T_m) of DNA?
 - c) Explain the process of nick translation.
 - d) State the role of XP genes in nucleotide excision repair system.
 - e) What is intrinsic terminator?
 - f) State the role of TBP (TATA box binding protein) in eukaryotic transcription.
 - g) Enlist the types of histones and diagrammatically represent their association with DNA in nucleosome.
- Q.2** a) Describe the structure and role of centromere. **(05)**
b) Explain wobble hypothesis. **(05)**
- Q.3** a) Describe the structure and role of DNA polymerase III holoenzyme complex using labeled diagram. **(05)**
b) Outline the steps involved in eukaryotic DNA replication. **(05)**
- Q.4** Write short notes on any **TWO**: **(10)**
- a) Excision repair
 - b) Mismatch repair
 - c) Holliday model

SECTION – II

- Q.5** Attempt any **TWO** of the following: **(10)**
- a) Describe specific sequences of typical bacterial promoter and its interaction with RNA polymerase subunits.
 - b) Enlist various sigma factors in *E. coli* and elaborate on their role in transcription.
 - c) Describe the structure of RNA polymerase II in eukaryotic cell and state the significance of its carboxy terminal domain (CTD) tail in transcription.
- Q.6** a) Explain the bipartite promoter and its interaction with RNA polymerase I. **(05)**
b) Outline the steps involved in splicing of introns through lariat formation. **(05)**
- Q.7** Explain the role of following in proteins synthesis: **(10)**
- i) IF2 ii) Peptidyl transferase iii) EF-TU, iv) EF-G
 - v) Shine-Dalgarno sequence
- Q.8** a) Explain the role of following in translocation of proteins; **(05)**
i) Cotranslational translocation and ii) Signal peptide
- b) Explain the regulation of Tryptophan operon by attenuation control. **(05)**

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