

**SARDAR PATEL UNIVERSITY**  
**MICROBIOLOGY (USO5CMIC01)**

## Fundamentals of molecular biology

Date: 22/10/2018 , Monday

B.Sc. - V SEM

**Time: 10:00 a.m to 1:00 p.m**

**TOTAL MARKS: 70**

**Note: Figures on the right indicate marks**

**Q-1): Attempt the following multiple choice questions.**

(10)

- 1) Watson & Crick model of DNA is this form of DNA.  
a) A-form  
b) B-form  
c) C-form  
d) All of these
- 2) The width of DNA as proposed by Watson & Crick is :  
a) 34 Å  
b) 3.4 Å  
c) 20 Å  
d) 2 Å
- 3) Telomerase is an example of :  
a) RNA dependent RNA polymerase  
b) DNA dependent DNA polymerase  
c) RNA dependent DNA polymerase  
d) DNA dependent RNA polymerase
- 4) RNA Replicase is found in -----.  
a) QB virus  
b) HIV virus  
c) Avian Sarcoma virus  
d) None of these
- 5) PCNA stands for:  
a) Proliferating cell nuclear antibody  
b) Polycyclic nuclear antibody  
c) Polycyclic nuclear antigen  
d) Proliferating cell nuclear antigen
- 6) Reverse gyrase is an example of:  
a) Reverse transcriptase  
b) Topoisomerase  
c) Primase  
d) None of these
- 7) The RNA polymerase core enzyme from *E.coli* does not include this subunit.  
a)  $\alpha$   
b)  $\sigma$   
c)  $\beta$   
d)  $\omega$
- 8) Termination of protein synthesis in *E.coli* involves this factor.  
a) EFG  
b) EFTu  
c) RF1  
d) IF1
- 9) This RNA is present on the small subunit of prokaryotic ribosome.  
a) 5s rRNA  
b) 16s rRNA  
c) 5.8s rRNA  
d) 23s rRNA
- 10) Initiator tRNA carries this amino acid.  
a) valine  
b) methionine  
c) lysine  
d) none of these

①

(P.T.O.)

Q-2: Attempt the following questions. (Any 10)

(20)

- i) Draw the structure of ribose and deoxyribose.
- ii) What do you mean by nucleosome and chromatosome.
- iii) Write two features of A-form of DNA.
- iv) Write how termination of chromosomal DNA replication is attained in *E.coli*.
- v) Write two differences between DNA polymerase I & DNA polymerase III.
- vi) Explain the role of Rho protein.
- vii) Write the reaction involved in stage I of protein synthesis in prokaryotes.
- viii) Explain any two posttranslational modifications of protein.
- ix) Write the contribution of :
  - a) Arthur Kornberg    b) David Baltimore
- x) Write the key sequences of strong promoters in *E.coli*.
- xi) Mention the type of subunits and their constituent RNA in Prokaryotic ribosome.
- xii) Define:
  - a) Operon                      b) Endonuclease

Q-3: (A) Describe Watson and Crick's model of DNA.

(06)

(B) Discuss Hershey and Chase experiment.

(04)

OR

Q-3: (A) Write a note on tRNA and mRNA.

(07)

(B) Discuss Griffith's experiment.

(03)

Q-4: Explain the process of initiation & elongation of DNA replication in *E.coli*.

(10)

OR

Q-4: Discuss: (a) Meselson & Stahl's experiment

(06)

(b) Rolling circle model of DNA replication

(04)

Q-5: (A) Describe RNA splicing in detail.

(07)

(B) Write the components of RNA polymerase with their respective functions.

(03)

OR

Q-5: Explain regulation of gene expression with respect to lactose operon.

(10)

Q-6: Discuss salient features of genetic code.

(10)

OR

Q-6: Describe initiation and elongation of protein synthesis in prokaryotes.

(10)