

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1018

Unique Paper Code : 32231501

Name of the Paper : Molecular Biology

Name of the Course : B.Sc. (Hons.) Zoology

Semester : V

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Question No.1 is compulsory.
3. Attempt five questions in all.
4. Draw neat, labelled diagrams wherever necessary.

I. (a) Define the following terms : (1×5=5)

(i) Replication fork

(ii) Exon shuffling

(iii) Enhancer

(iv) Polyribosome

P.T.O.

(v) Riboswitches

(b) Expand the following :

(0.5×6=3)

(i) cccDNA

(ii) TRCF

(iii) MSH

(iv) MTE

(v) ITS

(vi) ORC

(c) State the function of the following :

(1×5=5)

(i) TATA Box

(ii) TF II D

(iii) Shine-Dalgarno Sequences

(iv) RNase P

(v) Telomerase

(d) Differentiate between the following : (2×5=10)

(i) Leading and Lagging strands

(ii) RNA polymerase II and RNA polymerase III

(iii) A-site and P-site

(iv) Promoter and Operator

(v) miRNA and siRNA

(c) State the best-known contribution of the following scientists : (1×4=4)

(i) Roger Kornberg

(ii) Charls Yanofsky

(iii) Robert William Holley

(iv) Phillip Allen Sharp

2. Compare and contrast the process of transcription in prokaryotes and eukaryotes. (12)

3. (a) Discuss the process of activation of amino acids and formation of initiation complex in prokaryotes. (8)

(b) Describe the salient features of Genetic code. (4)

(a) Describe the sequence of events during DNA Replication in eukaryotes while explaining the role of various proteins involved in it. (8)

(b) Explain the Rolling circle replication in bacteria with suitable illustration. (4)

P.T.O.

5. (a) Explain how the deletion of the following features would affect a eukaryotic pre-mRNA? (6)
- (i) AAUAAA consensus sequence
  - (ii) 5' cap
  - (iii) Poly(A) tail
- (b) Explain (with illustration) the regulation of *Lac* operon. (6)
6. (a) Describe the structure of Globin Gene and explain the molecular mechanism of splicing. (8)
- (b) One gene may code for more than one polypeptide in eukaryotes. Justify the statement. (4)
7. Write short notes on the followings (any three): (3×4=12)
- (i) Structure of tRNA
  - (ii) RNA interference
  - (iii) Mismatch Repair
  - (iv) Synthesis of rRNA