

The figures in the margin indicate full marks for the questions.

1. Choose the correct answer : 1×7=7
- (i) The coding sequences in a slip gene are known as -
- (A) Introns
  - (B) Operons
  - (C) Exons
  - (D) Cistrons

Contd.

- (ii) Isotopes used by Meselson and Stahl, in proving semiconservative replication of DNA were -

- (A)  $^{14}N$   $^{14}C$
- (B)  $^{14}N$   $^{15}N$
- (C)  $^{14}N$   $^{31}P$
- (D)  $^{14}C$   $^{31}P$

- (iii) A particular triplet of bases in the template strand of DNA is 5' AGT 3'. The corresponding codon for mRNA transcribed is -

- (A) 5' TCA 3'
- (B) 3' UCA 5'
- (C) 3' ACU 5'
- (D) Either UCA or TCA, depending on wobble in the first base

- (iv) Which is the most abundant type of RNA ?

- (A) mRNA
- (B) tRNA
- (C) rRNA
- (D) hnRNA

- (v) The repeat sequence of nucleotides in telomere is -

- (A) TTGGGA
- (B) TTAGGG
- (C) GGGATT
- (D) TTGAGG

Contd.



(vi) Which of the following RNAs can induce gene silencing ?

- (A) ssRNA
- (B) snoRNA
- (C) miRNA
- (D) ncRNA

(vii) TBP stands for -

- (A) TATA box polymerase
- (B) Transcription factor binding protein
- (C) TATA box binding protein
- (D) None of the above

2. Write short notes on the following :

2×4=8

- (a) Replicons
- (b) Transcription unit

3 (Sem-5/CBCS) ZOO HC 1/G 4

- (c) RNA interference
- (d) Globin mRNA

3. Answer the following questions : (any three)  
5×3=15

- (a) Write the mechanism of rolling circle replication.
- (b) Discuss the salient features of Watson and Crick model of DNA.
- (c) Write a note on mismatch repair system.
- (d) Write a brief account of structure and assembly of ribosomes in prokaryotes.
- (e) State the role of Activator and Silencer in regulation of eukaryotic gene expression.

4. Why is DNA replication known as semi-discontinuous ? Discuss the role of various enzymes involved in eukaryotic DNA replication.  
2+8=10

3 (Sem-5/CBCS) ZOO HC 1/G 5 Contd.

Define spliceosome. Describe the process of mRNA splicing with suitable diagram. Why is alternative splicing significant ?

2+6+2=10

5. What is an operon ? Briefly describe about regulation of trp operon in *E. coli*. How do mutations in leader sequence affect regulation process ?  
2+6+2=10

Or

Define Transcription. Briefly discuss the differences between prokaryotic and eukaryotic transcription.  
2+8=10

6. What is genetic code ? Write the characteristics of genetic code. Explain degeneracy of genetic code with special reference to 'Wobble hypotheses'.

1+4+5=10

3 (Sem-5/CBCS) ZOO HC 1/G 6

Or

Give a detailed account of mechanism of translation in eukaryotes. How inhibitors of protein synthesis affect translation process ?

8+2=10

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3 (Sem-5/CBCS) ZOO HC 1/G 7

3000