

Total number of printed pages-7

3 (Sem-5/CBCS) ZOO HC 1

2024

ZOOLOGY

(Honours Core)

Paper : ZOO-HC-5016

(Molecular Biology)

Full Marks : 60

Time : Three hours

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

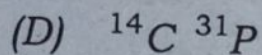
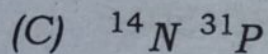
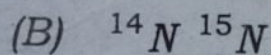
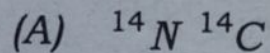
1. Choose the correct answer : $1 \times 7 = 7$

(i) The coding sequences in a slip gene
are known as -

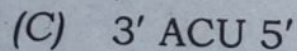
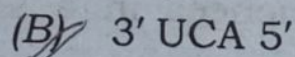
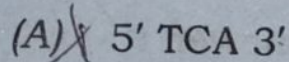
- (A) Introns
- (B) Operons
- (C) Exons
- (D) Cistrons

Contd.

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



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



(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

(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

- (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

Or

- ✓ 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

Or

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

8+2=10
