

**63/1 (SEM-5) CC11/ZOOHC5116**

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( Held in 2023 )

**ZOOLOGY**

Paper : ZOOHC5116

( **Molecular Biology** )

*Full Marks : 60*

*Pass Marks : 24*

*Time : 3 hours*

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

1. Choose the correct options from the following : 1×5=5

(a) RNA polymerase binds to

- (i) regulator gene
- (ii) promoter gene
- (iii) operator gene
- (iv) structural gene

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- (b) tRNA consisting of three unpaired bases constitute
- (i) codon
  - (ii) anticodon
  - (iii) clover-leaf model
  - (iv) acceptor loop
- (c) A change in the wobble position of a gene means a change in the
- (i) first base of codon
  - (ii) second base of codon
  - (iii) third base of codon
  - (iv) whole of codon
- (d) Okazaki is known for his contribution to the understanding of
- (i) transcription
  - (ii) translation
  - (iii) DNA replication
  - (iv) mutation

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( Continued )

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- (e) The haploid content of human DNA is
- (i)  $3.3 \times 10^6$  bP
  - (ii)  $3.3 \times 10^9$  bP
  - (iii)  $4.6 \times 10^6$  bP
  - (iv)  $6.6 \times 10^9$  bP

2. Answer the following questions : 2×5=10

- (a) What do you mean by transcription unit?
- (b) Draw a structure of tRNA.
- (c) What are introns and exons?
- (d) What do you mean by degeneracy of genetic code?
- (e) Define gene silencing.

3. Answer any five questions of the following : 5×5=25

- (a) Explain the semi-conservative mode of DNA replication.
- (b) Write a short note on mismatch repair.
- (c) Describe about the exon shuffling and mechanism of splicing.

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( Turn Over )

- (d) What are the factors involved in prokaryotic and eukaryotic transcription? Discuss.
- (e) Explain the characteristics of genetic code.
- (f) Explain the Watson and Crick model of DNA double-helical structure.
- (g) Give an account on miRNA and siRNA.

4. Answer any *two* of the following questions :

10×2=20

- (a) What do you mean by transcription regulation? Explain the principle of transcriptional regulation with lac operon model. 2+8=10
- (b) Where does translation occur in cell? Explain the detailed process of protein synthesis in prokaryotes. 1+9=10
- (c) What is genetic imprinting? Write briefly on the structure and assembly of ribosome in prokaryotes. 2+8=10

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