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5 SEM TDC ZOOH (CBCS) C 11

2025

(Nov/Dec)

ZOOLOGY

(Core)

Paper : C-11

(**Molecular Biology**)

Full Marks : 53

Pass Marks : 21

Time : 3 hours

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

1. Fill in the blanks : 1×5=5

(a) The nitrogenous base that is never found in the genetic code is _____.

(b) In RNA, uracil pairs with _____.

(c) Genetic code consists of _____ different codes.

(d) _____ is the second level of regulation of tryptophan operon.

(e) _____ (1966) proposed the Wobble hypothesis.

(2)

2. Explain briefly (any two) : $4 \times 2 = 8$

(a) Alternative splicing

(b) Gene silencing

(c) DNA mismatch repair

3. Write notes on (any two) : $4 \times 2 = 8$

(a) Genetic imprinting

(b) Exon shuffling

(c) miRNA

4. Compare the process of DNA replication in prokaryotes and eukaryotes. 8

Or

Describe the process of replication of dsDNA with the help of appropriate illustrations.

5. Describe the structure and function of RNA polymerase in gene transcription. $5 + 3 = 8$

Or

Describe the Watson and Crick's model of DNA. Write a note on the Chargaff's rule of DNA composition. $5 + 3 = 8$

(3)

6. Draw and describe the structure of tRNA. Discuss the roles of tRNA and aminoacyl-tRNA synthetases in translation. $4 + 2 + 2 = 8$

Or

Describe the key proteins involved in initiation, elongation and termination during translation. List their respective roles. $5 + 3 = 8$

7. What are post-transcriptional modifications? Describe the process and significance of the following post-transcriptional modifications : $2 + 6 = 8$

(a) mRNA capping

(b) mRNA splicing

(c) mRNA polyadenylation

Or

Describe the lac operon in *E. coli* with suitable illustrations. Also describe its regulation. $4 + 4 = 8$
