

Total number of printed pages - 4

**3 (Sem-5 / CBCS) ZOO HC 1  
2021**

(Held in 2022)  
**ZOOLOGY**  
(Honours)

Paper : ZOO-HC-5016

**(Molecular Biology)**

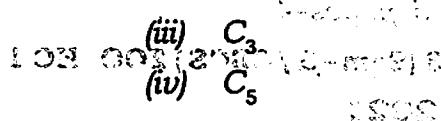
**Full Marks : 60**

**Time : Three hours**

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

1. Choose the correct answer : 1×7=7
- (a) Which of the following is not a post-transcriptional modification ?
- (i) Splicing
  - (ii) 5' capping
  - (iii) 3'adenylation
  - (iv) Glycosylation
- (b) In the carbon skeleton of the pentose sugar in DNA, the attachment point of a base to form a nucleoside is
- (i) C<sub>1</sub>
  - (ii) C<sub>2</sub>

**Contd.**



- (c) The DNA binding protein that initiates the transcription of bacterial genes is called
- (i) operator
  - (ii) sigma factor
  - (iii) repressor
  - (iv) promoter
- (d) Which of the following amino acids has the greatest number of codons?
- (i) Proline
  - (ii) Leucine
  - (iii) Tryptophan
  - (iv) Aspartic acid
- (e) Tryptophan operon in *E. coli* is an example of
- (i) inducible operon
  - (ii) positively regulated operon
  - (iii) repressible operon
  - (iv) All of the above
- (f) In the process of DNA synthesis in *E. coli*, the RNA primers are excised by the exonuclease activity of
- (i) DNA polymerase I

- (g) During elongation of polypeptide chain in translation, the peptide bonds are formed by the enzyme
- (i) peptidyl transferase
  - (ii) peptidyl ligase
  - (iii) aminoacyl tRNA synthetase
  - (iv) peptidyl polymerase

2. Write short notes on the following : **(any four)**

2×4=8

- (a) Degeneracy of the genetic code
- (b) Riboswitches
- (c) rho-independent termination
- (d) RNA splicing
- (e) Watson-Crick model of DNA.

3. Answer **any three** from the following questions:

5×3=15

- (a) Write the salient features of B-form of DNA. 5
- (b) What do you mean by gene silencing? Write the role of silencers in the process of transcription. 2+3=5

- (c) What is pyrimidine dimerization ? Explain the photoreactivation repair of thymine dimers in DNA. 1+4=5
- (d) Write a note on replication of telomeres. 5
- (e) Citing proper examples, write the role of inhibitors of protein synthesis. 5
4. Briefly explain the mechanism of DNA replication in prokaryotes. 10

**Or**

What do you mean by a promoter site ? Explain the mechanism of transcription in prokaryotes with suitable diagrams. 2+8=10

5. What is the difference between prokaryotic and eukaryotic ribosome ? Briefly explain the assembly of a prokaryotic ribosome and discuss about the functional sites or active sites of a ribosome. 1+(5+4)=10

**Or**

Explain the mechanism of protein synthesis in prokaryotes. 10

6. Give an illustrative account on the regulatory mechanism of lac operon in *Escherichia coli*. 10

**Or**

Write the role of activators and enhancers in transcription regulation of eukaryotes. 5+5=10