[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1107 **I**

Unique Paper Code : 32232013502

Name of the Paper : Cell and Molecular Biology

Name of the Course : **B. Sc. (Hons) Zoology (NEP-UGCF 2022)**

Semester : V

Duration : 2 Hours Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **Four** Questions, including Question No. **1** which is compulsory.
3. Draw neat labelled diagrams wherever necessary.

1. (a) Define the following (**Any Four**) : (4×1=4)

   (i) Yamanaka factors

   (ii) Ribozyme

   (iii) Silencer elements

P.T.O.

(iv) Central Dogma

(v) Split genes

(b) Differentiate between **(Any Three)** : (3×2=6)

(i) Euchromatin and Heterochromatin

(ii) Apoptosis and Necrosis

(iii) Activators and Repressors

(iv) Totipotent and Pluripotent Stem cells

(c) Expand the following : (0.5×6=3)

(i) CPSF

(ii) CREB

(iii) NELF

(iv) RNP

(v) ORF

(vi) CAP- cAMP

(d) State the reasons : (2×1=2)

(i) Why transcription occurs in 5' to 3' direction only?

(ii) Why primase is required for DNA replication but not for transcription?

2. (a) Discuss the mechanism of DNA replication in a bacterial cell. (10)

(b) Discuss the salient features of Genetic code. (5)

3. (a) Define Apoptosis and write down its hallmark features. Explain the intrinsic pathway in regulation of apoptosis with the help of suitable examples. (10)

(b) Design an experiment to prove that DNA replication is semi-conservative. (5)

4. (a) With the help of suitable diagram describe the process of transcription in Eukaryotes. (10)

(b) Write down the main differences between eukaryotic and prokaryotic translation. (5)

5. (a) What is cell signalling and importance of second messengers? Write the major differences of hormone signalling mechanism of nuclear receptor pathway and cell surface receptor pathway? (10)

P.T.O.

(b) What is end replication problem? Discuss the role of telomerase in replication of 5' end of linear chromosome. (5)

6. Write short notes **(any three)** : (3×5=15)

(a) Alternative splicing

(b) Lac Operon

(c) Synthesis of rRNA

(d) RNA editing