

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- FEB-2023

COURSE CODE (CREDITS): 18B11BT412 (3)

MAX. MARKS: 15

COURSE NAME: MOLECULAR BIOLOGY

COURSE INSTRUCTORS: Dr. JITENDRAA VASHISTT

MAX. TIME: 1 Hour

*Note: All questions are compulsory. Marks are indicated against each question in brackets.*

**Q1. a)** How many and type of major RNAs are present in a cell which participates for transcription and translation processes? **(COI) (2mark)**

**b)** Which of the structure (single strand or double strand) will be attained by following RNA sequences 'i' and 'ii'?

**(i)** 5'-AAGAGAGAGAGAAUCCAGUGCAAACGAAAA-3'

**(ii)** 5'-AGCGCGCAGCGGCUGCGCAGUGCGCCGGCAA-3'

Justify your answer with suitable example with the different RNAs present in cell and their structural feature. **(COII) (2marks)**

**Q2. a)** How do you calculate the amount of other three nucleotides, if the amount of thymine is 30% in a specific genome? **(COI) (2 marks)**

**b)** Which of the following equation '(i)' or '(ii)' is correct according to 'Chargaff rule'? You also need to prove the equation with the help of answer of above mentioned question i.e. '2a'.

**(i)**  $A+G=T+C$  **(ii)**  $A+T=G+C$  **(COI) (2 marks)**

**Q3.** 'There is a nitrogenous base of nucleotide of DNA which can be deaminated to form a specific nitrogenous base of nucleotide of RNA'. Identify both of the nitrogenous bases and also draw the complete structure of both of the nucleotides. **(COI) (3 marks)**

**Q4.** Design a strategy to purify a protein which is present inside the nucleus of a cell and usually binds tightly with DNA. **(COII) (2 marks)**

**Q5.** Which of the amino acids are responsible for absorbance maximum at 280 nm when checked in a spectrophotometer? You need to define their properties with structural representation. **(COI) (2 marks)**