

U.G. 5th Semester Examination - 2021

ZOOLOGY

Course Code : BZOOCCHC501

Course Title : Molecular Biology

Full Marks : 30

Time : 2 Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

1. Answer any **ten** questions from the following:

1×10=10

- What is degenerate primer?
- Which enzyme reduces the tension during the unwinding of DNA helix in front of the replication fork?
- What is TATA box?
- Define spliceosome.
- What is poly cistronic mRNA?
- rRNA is synthesized in which portion of a cell?
- Write the codon for anticodon of 3' UUA5'.

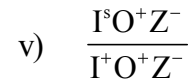
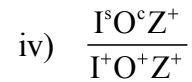
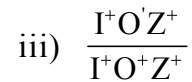
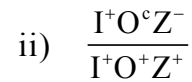
- In the genetic code dictionary, how many codons are used to code for all the 20 essential amino acids?
- Define chaperons.
- What is rho factor?
- What is corepressor?
- What are the significance of CPG islands?
- What is holiday junction?
- What is SOS response?
- What do you mean by codon degeneracy?

2. Answer any **five** of the following questions:

2×5=10

- What is the difference between a deoxyribonucleotide and dideoxyribonucleotide?
- When performing a western blot, what is the purpose of adding a secondary antibody?
- How photo dimers in DNA is repaired?
- Which processes in protein synthesis require hydrolysis of GTP? What is Shine-Dalgarno sequence?

- e) Which bond is used to stabilize the double helix of DNA? What is Tm?
- f) Why do you think that most promoter regions are A-T rich?
- g) What are the differences between Group I and Group II introns?
- h) What do you mean by 'coupled transcription-translation'?



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

5×2=10

- a) Give an account of double strand break model of DNA recombination. 5
- b) Write short notes on the following :
 - i) Wobble hypothesis
 - ii) Exon shuffling
- c) The table below gives the genotypes (lac operon) of several partial diploid *E.coli* strain. Fill the phenotypes using '+' for β-galactosidase synthesis and '-' for no β-galactosidase synthesis. Glucose is absent in all cases. 5

Genotype Phenotype for β-galactosidase production

Non-inducer

Inducer

