

SIXTH SEMESTER B.A./B.Sc. DEGREE EXAMINATION, MARCH 2020

(CUCBCSS—UG)

Zoology

ZOL 6B 12—MOLECULAR BIOLOGY AND BIOINFORMATICS

Time : Three Hours

Maximum : 80 Marks

Part AI. One word questions. Answer *all* questions. Each question carries 1 mark :

- 1 Griffith carried out his transformation experiments on _____ bacteria.
- 2 AUG code for _____ amino acid.
- 3 Genes that are required for the maintenance of basic cellular function, and are expressed in all cells of an organism is called _____.
- 4 One gene may be part of the other gene. Such genes are called _____.
- 5 Unit of mutation is _____.
- 6 KEGG is _____ database.
- 7 Write the full form 'EMBL' nucleotide sequence database.
- 8 Mention any *one* sequence similarity search used in pair-wise sequence alignment.
- 9 The set of expressed proteins in a given type of cell or organism, at a given time is called _____.
- 10 Needleman-Wunsch algorithm is an example of _____ alignment.

(10 × 1 = 10 marks)

Part BII. Short answer questions. Answer any *ten* questions. Each question carries 2 marks :

- 11 What are jumping genes ? Who discovered jumping genes ?
- 12 Write short note on lytic cycle of phages.
- 13 What are spliceosomes ?
- 14 Write notes on silencer sequences.
- 15 What is universality of genetic code ?

Turn over

- 16 Write short notes on satellite DNA.
- 17 What is central dogma reverse in Molecular biology ?
- 18 Write short notes on GenBank.
- 19 What is BLAST in bioinformatics ?
- 20 What is CLUSTAL X ?
- 21 What is metabolomics ?
- 22 Mention any *two* methods of DNA sequencing.

(10 × 2 = 20 marks)

Part C

III. Paragraph questions. Answer any *five* questions. Each question carries 6 marks :

- 23 Discuss the ethical concerns in Bioinformatics.
- 24 Give an account on the methodology and applications of DNA microarray.
- 25 Explain the steps involved in multiple sequence alignment.
- 26 What are database search engines ? Give an account on major database search engines.
- 27 Explain Hershey and Chase experiment.
- 28 Define genetic code. Explain the major features of genetic code.
- 29 Explain the negative regulation of lac operon.
- 30 Give an account on post-translational modification of proteins.

(5 × 6 = 30 marks)

Part D

IV. Essay questions. Answer any *two* questions. Each question carries 10 marks :

- 31 Explain the various steps and factors involved in the synthesis of mRNA. Add a note on the processing of mRNA.
- 32 Define genome. Explain the major features of eukaryotic genome.
- 33 Write an essay on the history, development, and scope of bioinformatics.
- 34 What are biological databases ? With suitable example explain the various types of biological databases.

(2 × 10 = 20 marks)