

2024

ZOOLOGY

ZOOL-1024

(Bioinformatics and Instrumentation)

Total Marks : 40

Time : 2 Hours

Total number of printed pages -2

The figures in the margin indicate full marks for the questions

1. Answer the following questions very briefly : 2×5=10
 - (a) What are the characteristics of biological data?
 - (b) What are various phylogenetic tree-building methods?
 - (c) How pulse gel electrophoresis works?
 - (d) How does immunoelectrophoresis separate proteins?
 - (e) Write the key difference between Fluorescence and Confocal microscope.

2. Answer any six of the following questions : 5×6=30
 - (a) What is BLAST? Describe the different types of BLASTs with their uses. 1+4=5
 - (b) Explain the differences between Needleman-Wunsch and Smith-Waterman methods for pairwise sequence alignment with appropriate example. 5
 - (c) For the following pair of sequences and given alignment parameters, align the sequences using Needleman-Wunsch method of global alignment. 5

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|-------------|---|----|---|---|---|---|
| Sequence 1 | = | M | P | Q | P | S |
| Sequence 2 | = | M | P | P | S | |
| Match | = | 1 | | | | |
| Mismatch | = | -1 | | | | |
| Gap penalty | = | -2 | | | | |

- (d) Describe the main applications of unit gravity centrifugation in biological research. 5
- (e) What is cryopreservation. Write different application of cryopreservation. 1+4=5
- (f) Write briefly the principles and techniques of Southern blotting. 2+3=5
- (g) Explain the principle and application of Fluorescent In Situ Hybridization (FISH) 2+3=5

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