

M.Sc. Examination, 2023  
Semester -IV  
Biotechnology  
Course XVI: Genomics, Proteomics and Bioinformatics

Time: 3 hrs

Full marks: 40

Questions are of value as indicated in the margin

Answer any four questions

- 1a. Describe DNA barcoding along with its merits and demerits..
- b. Explain BOLD
- c. Discuss one non-gel based proteomic technique. 4+2+4=10
  
- 2a. Discuss any four characteristics considered when choosing markers for DNA fingerprinting.
- b. Why are molecular marker systems better than classical markers in detecting variation?
- c. Compare the relative advantages and disadvantages of the following molecular markers.
  - i) SNPs
  - ii) SSRs2+2+(3+3)=10
  
- 3a. What are degenerate primers?
- 3b. Describe the steps of primer designing using any primer designing software.
- 3c. What are the critical parameters of primer designing?
- 3d. Describe Dynamic Programming. Differentiate local and global alignment in terms of algorithm. 1+3+2+4=10
  
- 4a. What is meant by sequence format? Explain three frequently used sequence formats.
- b. What is NGS. Explain one NGS technique. 4+6=10
  
- 5a. What is meant by Needleman-Wunsch algorithm?
- b. Calculate the best alignments from the following pair of DNA sequences assuming +2 for math, -2 for mismatch and -1 for gap penalty.  
ATGCCG  
ATGG 2+8=10
  
- 6. Write notes on any four of the following.
  - (i) BLAST
  - (ii) Pyrosequencing
  - (iii) cDNA microarray
  - (iv) AFLP
  - (v) Human genome project4x2.5 = 10