

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS-2025

B.Tech-V Semester (BI/BT)

COURSE CODE (CREDITS): 18B11BI512 (3)

MAX. MARKS: 35

COURSE NAME: Scripting Languages for Bioinformatics

COURSE INSTRUCTOR: Dr. Tiratha Raj Singh

MAX. TIME: 2 Hours

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems.

Q.No	Question	CO	Marks
Q1	Design and implement a web-based GUI for basic DNA sequence analysis that performs at least two of the following tasks chosen by you: GC content calculation, reverse complement, ORF finder, or k-mer frequency analysis. Ask the user to specify the input parameters (e.g., minimum ORF length, k for k-mer), expected outputs, and how front-end (HTML/JS) communicates with back-end (PHP) to run the analysis.	IV	5
Q2	Build an HTML form with JavaScript that accepts user details (name, email, contact number, and an accession code-alphanumeric). Validate each field for required type, allowed characters, and length using regular expressions. Show the JS validation logic, and provide three test cases (valid, invalid-type, invalid-length).	I, II	4
Q3	Using PHP's GD or Image based functions, write code to generate an image of an ellipse (oval) and then, without writing a separate new drawing function, show how you can reuse or parameterize the same code to produce a circle and a horizontally stretched oval. Explain which parameters control these shapes?	V	5
Q4	Write a PHP script that implements server-side processing for a simple bioinformatics lookup. The script should accept a gene name (from a POST request), perform basic logic to categorize the gene as "metabolic", "signaling", or "unknown" using a small in-script dictionary/array, and return a response to the user.	V	4
Q5	Explain and demonstrate to connect a PHP application to a MySQL database using mysqli procedural style. Show code snippets for: establishing a connection, selecting a database, preparing and executing a simple SELECT with one parameter, and handling errors securely. Also describe how the same connection is used to populate	IV	4

	an HTML+JS frontend.		
Q6	Demonstrate advanced usage of CSS by implementing a small webpage that uses CSS to present dynamic contents. Explain why each CSS feature was chosen and how it improves creativity and usability in web development.	II	4
Q7	Demonstrate in PHP three file-handling operations (create/write/read), three string-handling functions (e.g., strpos, substr, str_replace) and three array-handling operations (e.g., array_map, array_filter, array_merge) in the context of processing a small file. Provide the code and sample outputs.	V	5
Q8	Write a JavaScript program that demonstrates the use of slice() or substr(), match() (with regex), and Math.floor() with an example of each.	III	4