

**STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086****(For candidates admitted from the academic year 2023 – 2024 )****M. Sc. DEGREE EXAMINATION, NOVEMBER 2023****BIOINFORMATICS****FIRST SEMESTER****COURSE : CORE****PAPER : PROGRAMMING IN C++ AND PERL****MAX. MARKS: 50****SUBJECT CODE : 23BI/PC/CP14****TIME : 1 ½ HOURS**

<b>Q. No.</b>	<b>SECTION A (10 x 1=10 marks)</b> <b>All questions to be answered</b>	<b>CO</b>	<b>KL</b>
1	Which approach is used in C++? a) right-left    b) Top-down    c) left-right    d) bottom-up	CO1	K1
2	Which of the following is true about C++ programs? a) They are always smaller than C programs b) They must include the <iostream> header to use standard I/O c) They cannot use functions d) They don't support loops	CO1	K1
3	Which concept in C++ allows you to restrict access to certain class members from outside the class? a) Inheritance    b) Abstraction    c) Polymorphism    d) Encapsulation	CO1	K1
4	In Perl, how do you exit a loop prematurely? a) Using the break statement    b) Using the exit statement c) Using the return statement    d) By using the next statement	CO1	K1
5	In Perl, what is the purpose of a subroutine's signature? a) To indicate the subroutine's name    b) To specify the return type c) To define the arguments it accepts    d) To comment the code	CO1	K1
6	Of the following pair of statements, one is Assertion and the other is the possible reason. Read the Question carefully and answer according to the following key: Assertion: C++ provides inline functions to reduce the function call overhead. Reason: An inline function is a function that is expanded in line when it is called. a) Assertion and Reason are true statements and the Reason is an adequate explanation for Assertion. b) Both Assertion and Reason are true statements and the Reason is not adequate explanation for Assertion. c) Assertion is a true statement and Reason is a false statement. d) Both Assertion and Reason are false statements.	CO2	K2
7	Is the following statement correct for Perl? "Data Abstraction displays only the essential details to the user"  A. TRUE B. FALSE	CO2	K2
8	Which control structure is used to repeatedly execute a block of code while a condition is true? a) for loop    b) switch statement c) if statement    d) do-while loop	CO2	K2

9	In C++, what keyword is used to indicate that a class is inheriting from another class? a) inherits c) derives	b) extends d) public	CO2	K2
10	Polymorphism in C++ allows you to: a) Create multiple objects of the same class b) Write functions with the same name but different parameters c) Access private members of a class d) Inherit from multiple base classes		CO2	K2
<b>Q. No.</b>	<b>SECTION B (10 x 2= 20 marks)</b>		<b>CO</b>	<b>KL</b>
	<b>Answer any TEN questions</b>			
11	What are the standard input and output streams in C++, and how are they accessed?		CO3	K3
12	Differentiate between tokens and keywords in C++.		CO3	K3
13	Write a program to read the DNA file and transcribe it into RNA sequence		CO3	K3
14	What does the split function do in programming, and in which data types is it commonly used?		CO3	K3
15	Why is it important to close files properly after reading or writing in Perl, and how do you close a file?		CO3	K3
16	What would be the output of the following perl code: a. \$str = "Bioinformatics"; \$var = substr(\$str, 2, -3); print \$var;		CO3	K3
17	Name one BioPerl module related to sequence manipulation and briefly describe its purpose.		CO4	K4
18	List two key characteristics of the C++ programming language.		CO4	K4
19	Write down the output for the given perl script: a. \$x = "cgtagtgctg"; \$x =~ s/t/u/; b. print \$x;		CO4	K4
20	Outline the standard input and output streams in C++, and analyse how they are accessed?		CO4	K4
21	Differentiate between scalar, array, and hash data types in programming.		CO4	K4
22	What does the exists function do in programming when used with hash data types?		CO4	K4
<b>Q. No.</b>	<b>SECTION C (4 x 5= 20 marks)</b>		<b>CO</b>	<b>KL</b>
	<b>Answer FOUR questions with internal choice</b>			
23	a) Explain the data types, expression and control structures in C++ <b>(OR)</b> b) What are string operators? State its characteristics.		CO5	K5
24	a) Describe the purpose of back references in regular expressions and how they are denoted in Perl. <b>(OR)</b> b) Provide examples of alternative match patterns, including the use of the vertical bar ( ) to match multiple patterns.		CO5	K5
25	a) Discuss the benefits of using Perl IO for file operations, particularly in terms of flexibility and error handling. <b>(OR)</b> b) Explain the syntax for using sysopen() to open a file for reading or writing.		CO5	K6
26	a) How does the Bio::Annotation module in BioPerl facilitate the management of biological annotations? Provide an example. <b>(OR)</b> b) A researcher wish to display multiple DNA sequences from a FASTA file using Bioperl. Write a program which performs this task.		CO5	K6

\*\*\*\*\*