

**STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086**  
**(For candidates admitted from the academic year 2019 – 2020 and thereafter)**

**SUBJECT CODE: 19BI/PC/CP14**

**M. Sc. DEGREE EXAMINATION, NOVEMBER 2021**  
**BIOINFORMATICS**  
**FIRST SEMESTER**

**COURSE : CORE**  
**PAPER : PROGRAMMING IN C++ AND PERL**

**TIME : 3 HOURS**  
**MAX. MARKS: 100**

**SECTION A**

**ANSWER ALL THE QUESTIONS:**

**(15 x 1 = 15)**

1. The Wrapping of data and functions into a single unit is known as  
a. Data Abstraction    b. Data Encapsulation    c. Dynamic Binding    d. Inheritance
2. To increase the value of c by one which of the following statement is wrong?  
a. c++;                      b. c = c + 1;                      c. c + 1 => c;                      d. c += 1
3. The operator ~m is used to \_\_\_\_\_  
a. find a match,                      b. extract substring                      c. translate                      d. do math calculation
4. Identify errors:  
int a=12.5;  
float b=2.0;  
c=a+b;
5. Developer of perl is \_\_\_\_\_
6. Identify errors : \$array = ("one", "two", "three");
7. Arrays in perl is denoted with \_\_\_\_\_  
a. @a                      b. #a                      c. %a                      d. ^a
8. Every C++ program begins execution at the \_\_\_\_\_ function.
9. A class can inherit properties from more than one class is known as \_\_\_\_\_ inheritance.
10. A pointer is  
a. The variable that stores the reference to another variable  
b. The variable that stores reference of garbage variable  
c. The variable that stores the memory address of another variable  
d. A & C Both

11. Perl stands for \_\_\_\_\_
- a. Practical Extension Reporting language    b. Practical Extraction Report Language  
c. Practice Extension Reporting Language    d. Practice Extraction Report Language
12. Destructor is preceded with \_\_\_\_\_
13. Use of g modifier along with substitution makes it \_\_\_\_\_
- a. case sensitive                      b. local                      c. global                      d. error
14. Subroutines can also be called using the \_\_\_\_\_ operator
- a. #                      b. &                      c. ^                      d. %
15. Character classes of regular expressions include \_\_\_\_\_ to match the text “bed” or “ced”
- b. {b/c}e                      b[bc]d                      c. (bc)ed                      d. (b/c)ed

## SECTION B

**Answer any THREE in detail:**

**(3X15=45)**

21. What is OOPs concept? Give a brief explanation of constructors and destructors.
22. What is bioperl? Discuss a bioperl code to convert a genbank sequence to fasta sequence.
23. Create two strings in C++ and use the following functions – at(); swap(); find\_first\_of(); length(); replace(); size(); capacity(); compare(); insert(); replace();
24. Explain the following:
- a) What are the different ways to open files in perl?  
b) What are functions? List out any 5 built in functions in perl
25. What are regular expressions in perl? Explain their types with examples.

**SECTION C****Execute Any Three Programs****(3X10=30)**

26. Execute a C++ program to find if 453 is an Armstrong number
27. Execute a C++ program to find if the number 53 is prime
28. Execute a perl program to calculate the frequency of bases for the sequence  
“ATTAAAGGTTTATACCTTCCCAGGTAACAAACCAACCAACTTTCGATCTCTT  
GTAGATCTGTTCTCTAAACGAACTTTAAAATCTGTGTGGCTGTCACTCGGCTG  
CATGCTTAGTGCACCTCACGCAGTATAATTAATAACTAATTACTGTCTGTTGACA  
GGACACGAGTAACTCGTCTATCTTCTGCAGGCTGCTTACGGTTTCGTCCGTGT  
TGCAGCCGATCATCAGCACATCTAGGTTTCGTCCGGGTGTGACCGAAAGGTA  
AGATGGAGAGCCTTGTCCCTGGTTTCAACGAGAAAACACACGTCCAACCTCAG  
TTTGCCTGTTTTACAGGTTTCGCGACGTGCTCGTACGTGGCTTTGGAGACTCCG  
TGGAGGAGGTCTTATCAGAGGCACGT”
29. Execute a perl program to convert the above sequence into RNA and find its reverse complement.
30. Record (10 )

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