2021
COMPUTER SCIENCE

Total marks : 70   Time : 3 hours

General instructions:
i)   *Approximately 15 minutes is allotted to read the question paper and revise the answers.*
ii) *The question paper consists of 32 questions. All questions are compulsory.*
iii) *Marks are indicated against each question.*
N.B: *Check that all pages of the question paper are complete as indicated on the top left side.*

1. How is '/' operator different from '%' operator?   **1**

2. What is a string?   **1**

3. Define structure.   **1**

4. Define objects.   **1**

5. What are member functions?   **1**

6. Why is constructor needed?   **1**

7. What is meant by inheritance?   **1**

8. What is an Array?   **1**

9. Define linked list.   **1**

10. What is query?   **1**

11. What are binary variables?   **1**

12. Define Router.   **1**

13. What is the difference between (i) num = 0 (ii) num==0?   **2**

14. Why is main function special? Give two reasons.   **2**

15. What is meant by Data encapsulation and Data hiding?   **2**

16. Write the format of class declaration.   **2**

17. Find the error, if any in the following program: **2**
    class num{

```
    int n;
    public;
    int num() {
     n=4;
    }
     void display(){
     cout<<n;
       }
```

18. Give the format of derived class declaration with an example.   **2**

19. What is a data structure? Give one example of non linear data structure.   **2**

20. Write an algorithm to push element into the stack.   **2**

21. What is the use of UPDATE command?   **2**

22. Draw a logical Circuit Diagram for the following Boolean Expression:
    X'.(Y'+Z)   **2**

23. Why are Computer Viruses also called viruses?   **2**

24. What is polymorphism? Give a suitable example of the same.   **4**

25. Explain different ways to declare member functions in C++ with suitable
    example.   **4**

26. **a.** Write a program to demonstrate overloading Constructor with array of class
         object.
                                    OR   **4**

     b. Write some of the special characteristics of destructors.

27. **a.** What is visibility modes in class derivations? What are those modes?
                                    OR   **4**
     b. Explain the different types of inheritance.

28. **a.** The following numbers : (89, 20, 31, 56, 20, 64, 48) are required to be sorted
         using bubble sort. Show how the list would appear at the end of each pass?
                                    OR   **4**
     b. Considering the following key set : 42, 29, 74, 11, 65, 58. Use insertion sort
         to sort the data in ascending order and indicate the sequences of steps
         required.

29. **a.** Evaluate the following postfix expression using stack and show the contents
         of stack after execution of each step.   **50, 40, +, 18, 14, -, 4, *, +**
                                    OR   **4**

b. Obtain the postfix notation for the following infix notation of expression showing the contents of the stack and postfix expression formed after each step of conversion: **A*B+(C-D/F)**

30.   Write the SQL for (a) ,(b) and write the output of (c),(d) on the basis of the table **TEACHER**:   **4**

NO.	NAME	Age	Department	Dateofjoin	Salary	Sex
1	Jugal	34	Computer	10/01/97	12000	M
2	Sharmila	31	History	24/03/98	20000	F
3	Sandeep	32	Maths	12/12/96	30000	M
4	Sangeeta	35	History	01/07/99	40000	F
5	Rakesh	42	Maths	05/09/97	25000	M
6	Shyam	50	History	27/06/98	30000	M
7	Shiv Om	44	Computer	25/02/97	21000	M

(a) To show all information about the teacher of History department
(b) To count the number of teachers with age greater than 32.
(c) Select MAX(age) from TEACHER where Sex="M";
(d) Select AVG(Salary) from TEACHER WHERE Sex="F";

31.   Obtain a simplified form for the Boolean expression: **4**
F(a,b,c,d) = $\sum$(4, 5, 6, 7, 9, 11, 12, 13, 14, 15) using Karnaugh map method.

32.   **a.** What is URL? How do absolute and relative URLs differ?
                                    OR   **4**
b. What is the difference between Message Switching technique and Packet Switching technique?

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