

2018

COMPUTER SCIENCE
(Theory)

Full Marks : 70

Pass Marks : 21

Time : Three hours

All the question are compulsory.

The figures in the right margin indicate full marks for the questions.

Select the correct answers from each of the following (1 – 4) and rewrite it.

1. When several classes inherit from the several base class it is known as – 1
A. Multiple inheritance.
B. Multilevel inheritance.
C. Hierarchical inheritance.
D. Hybrid heritance.
2. Which switching technique breaks down the message into smaller elements ? 1
A. Message switching
B. Packet switching
C. Circuit switching
D. None of the above

3. Which of the following is **NOT** the characteristic of Friend function ? 1
- A. It can be invoked like a normal function.
 - B. Like member function a friend function can access the member names directly.
 - C. It can be declared either in the public or the private part of a class.
 - D. It has objects as arguments.
4. The DELETE command – 1
- A. removes tuples from a relation.
 - B. removes existing tables from a database.
 - C. removes existing views from a database.
 - D. retrieves tuples from a table or view.

Answer Question Nos. (5 – 14) in a word or sentence each.

5. What are objects in OOP ? 1
6. Give the main difference between procedural oriented programming and object oriented programming. 1
7. What is the precondition for binary search ? 1
8. Write the drawback of bubble sort. 1

9. Find the dual of $(a + \bar{b} + \bar{c}) \cdot ab$ 1
10. Write the Absorption theorem of Boolean algebra. 1
11. How is a class different from a structure ? 1
12. Create and open a file called 'TEXT' for reading using open (). 1
13. Name the linear data structure implemented in FIFO manner. 1
14. Why is firewall necessary in networks ? 1

Give short answer of the following questions (15 – 24) in about 30 words each.

15. Define a constructor. How it is declared ? 2
16. Write the general form of defining a derived class. 2
17. List *any two* used of DBMS. 2
18. Minimize the Boolean expression algebraically : 2
 $(x + y)(x + y)$
19. Write the meanings of the following statements : 2
ifstream infile ;
(a) infile.seekg (m, ios :: cur) ;
(b) infile.seekg (0) ;
20. Explain self referential structure giving with example. 2

21. When a class should be derived publicly and privately. 2
22. Evaluate the postfix expression : 2

20,8,4, /, 2,3,+,*, -

23. Represent $A + B \cdot \bar{C}$ with the help of NAND gates only. 2
24. Obtain a simplified form for the following Boolean expression using K-Map. 2

$$F(a, b, c, d) = \sum(5, 7, 10, 11, 12, 13, 14, 15)$$

Give answer of the following questions (25 – 31) in about 50 words each.

25. Define a class employee with the following specifications. 3

Private members :

Name 30 characters

BASIC, DA, HRA float

Salary float

Total () function calculates the salary and returns it.

Salary is the sum of BASIC, DA, and HRA.

Public members :

Getdata () function accepts the data values to invoked the Total () function.

Output () prints the data.

26. Write a function in C++ for Selection sort. 3
27. What is the most common protocol used for transferring E-mail across the Internet? Write *one* advantage and disadvantage of using optical fibre. 3
28. Write a C++ program to find the biggest of three numbers using function by returning pointers. 3

29. Consider the following declarations and answer the questions given below : 3

```
class X
{
int A;
protected :
int B,C;
public :
int D;
void readdata ();
void writedata ();
};
class Y : protected X
{
int M, N;
protected :
void getdata ();
public :
void putdata ();
};
class Z : public Y
{
int P;
void show ();
public :
void display ();
};
```

- Name the data members that can be accessed from the function `putdata ()`.
- Name the protected member functions of the class Y.
- Name the public member functions of the class Z.

30. Define a linked list. List *any two* advantages of linked list over arrays. 3

31. What do you mean by Network security? Differentiate between a hacker and a cracker. 3

Answer Question (32 to 34) in about 120 words each.

32. (a) Define the term Attribute and Cardinality in the relational data model.
(b) What is the significance of the function COUNT (*) in SQL?
(c) Consider a table emp containing fields empno, empname, empsex, and empsalary. Write the SQL commands
(i) to list all the employees whose name starts with "S"
(ii) to display all the female employees whose salary is more than 30000.

2+1+2=5

33. Write a C++ program to implement a Stack. 5
34. Write a C++ program to add two given lengths (in feet and inches) using objects as function arguments. 5