

2018

COMPUTER SCIENCE
(Theory)

Full Marks : 70

Pass Marks : 21

Time : Three hours

All the questions are compulsory.

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

1. A constructor that can take arguments are called – 1
A. Parameterize Constructor
B. Default Constructor
C. Copy Constructor
D. Destructor

2. Using the structure pointer, the members of a structure are accessed by – 1
A. Dot operator
B. Arrow operator
C. New operator
D. Delete operator

P.T.O.

3. Data types that are not composed of other data types are known as – 1

- A. Non-primitive data type
- B. Primitive data type
- C. Non linear data structure
- D. Simple data structure

4. Routers work on – 1

- A. Network layer
- B. Transport layer
- C. Physical layer
- D. Session layer

Give very short answers to the following questions (5 - 14).

5. What is a reference variable ? 1

6. When will the structure tag be omitted ? 1

7. How are the objects behaviour and objects characteristic represented in OOP ? 1

8. How can the private data of a class be accessed ? 1

9. What is data element? 1
10. Consider a circular queue $Q[30]$, find the number of element in Q if $FRONT = 4, REAR = 10$. 1
11. Define "Candidate key" in a relational data structure. 1
12. Write the dual of the Boolean expression $(ab + c)(b' + a)$ 1
13. Define Cyber Space. 1
14. Write the following abbreviations in the full form : 1

FTP, WAN

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

15. Write the general form of a class declaration. 2
16. What is constructor overloading? Give an example. 2
17. How can the end of the file be detected? 2
18. Write a function in C++ to exchange the contents of two variables using pointers. 2
19. What is the purpose of a pointer called TOP in the context of a stack? Write the overflow and underflow condition of a stack. 2
20. What is normalization? Define second normal form. 2

21. Consider the two relations given below :

2

Name	Age	Class
X	12	VIII
Y	11	IX
Z	12	IX

Name	Age	Class
A	17	XI
B	18	XII
C	17	XII

Find

(i) $T_1 \cup T_2$

(ii) $T_2 - T_1$

22. Draw a circuit diagram to realize the following expression :

$$F(a,b,c) = ab + ac' + a'b'c$$

2

23. Prove that the dual of an XOR operation is equivalent to its complement.

2

24. Draw a neat diagram of client / server architecture.

2

Give answers of the following questions (25 – 31) .

25. What are the significance of visibility modes ?

3

26. "Inheritance allows code reusability in OPP". Explain how ?

3

27. Define the following :

3

(a) circular queue

(b) doubly linked list

(c) circular linked list

28. An array MARKS [50] contains the marks of 50 students in a class. Write a C++ function to count the number of students. 3

(a) Who scored more than 50

(b) Who scored less than 33

29. Write SQL commands for the following based on STUDENT table having fields :
Sno, Class, Name, Game, Game Grade, SUPW, SUPW Grade. 3

(a) Display the number of students getting Grade 'A' in cricket.

(b) Add a new column named 'Marks'.

(c) Arrange the whole table in alphabetical order to SUPW.

30. Convert the following boolean expression into the equivalent cononical product of sum (POS) form : $A\bar{B}C + \bar{A}BC + \bar{A}\bar{B}C$. 3

31. (a) Name the device used to connect a computer to an analog telephone line.

(b) Mention one advantage of STAR topology in networking.

(c) What is the difference between MAN and WAN? 3

Answer to the following questions (32 to 34) .

32. Write a C++ program to find the sum of the following series. 5

$$1 + X + X^2 + X^3 + \dots + X^n$$

33. Declare a structure to represent a complex number (a number having a real part and imaginary part). Write a C++ program to multiply and divide two complex numbers. 5
34. Write a C++ program to sort a set of randomly entered numbers in descending order by selection sort method. 5