



2018 VI 08

0930

Seat No. :

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Time : 2½ Hours

COMPUTER SCIENCE
(New Pattern)

Subject Code

H	7	0	5
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Total No. of Questions : 28

(Printed Pages : 8)

Maximum Marks : 55

- INSTRUCTIONS:**
- All questions are **compulsory**, however there is an internal choice for question number 22, 27 and 28.*
 - Question number **1 to 5** should be attempted **only** once.*
 - Programs should be written in C++ **Only**.*
 - State your assumptions **clearly**.*
- Section A : Consists of 10 questions of **01** mark **each**.*
*Section B : Consists of 11 questions of **02** marks **each**.*
*Section C : Consists of 05 questions of **03** marks **each**.*
*Section D : Consists of 02 questions of **04** marks **each**.*

SECTION – A

- Write the CORRECT alternative from those given below : [1]
Wrapping of data and functions that operates on data together in a single entity class is called
 - Encapsulation
 - Polymorphism
 - Data abstraction
 - Inheritance
- Write the CORRECT alternative from those given below : [1]
The process of inserting new node on stack is
 - POP
 - PUSH
 - INSERT
 - ADD



3. Write the CORRECT alternative from those given below : [1]
Which are the file modes that take the put pointer to the end of the file when file is opened ?
- ios :: app & ios :: ate
 - ios :: app & ios :: trunc
 - ios :: ate & ios :: in
 - ios :: in & ios :: out
4. Write the CORRECT alternative from those given below : [1]
Identify the Demorgan's law from those given below
- $A + AB = A$
 - $A + \bar{A} = 1$
 - $\overline{A + B} = \bar{A} \cdot \bar{B}$
 - $\overline{A \cdot B} = \bar{A} \cdot \bar{B}$
5. Write the CORRECT alternative from those given below : [1]
A user can get files from another computer on the internet by using
- HTTP
 - TELNET
 - FTP
 - UTP
6. What are inline functions ? [1]
7. What is a linked list ? [1]
8. State any one points of difference between linear linked list and one dimensional array. [1]
9. What is a Router in computer network ? [1]
10. What is the purpose of modem in computer network ? [1]

SECTION – B

11. Determine the output of the following program [2]
- ```
include < iostream.h >
include < conio.h >
Class player
{
```



```
int score, level ;
char Game ;
Public :
Player (char GGame = 'A')
{score = 0, level = 1, Game = GGame ; }
Void start (int sc) ;
Void next () ;
Void disp ()
{
 Cout << Game << "@" << level << Score << end c ;
}
};
Void Player :: next ()
{ Game = (Game == 'A') ? 'B' : 'A' ; }
Void Player :: start (int sc)
{
 Score + = sc ;
 if (score > = 100)
 level = 3 ;
 else
 if (score > = 50)
 level = 2 ;
 else
 level = 1 ;
}
void main ()
{
 Player P, Q ('B') ;
 P. disp () ;
 Q. start (75) ;
 Q. next () ;
 P. start (120) ;
 Q. disp () ; P (disp) ;
 Player r ; r. disp () ;
}
```

12. Write any four characteristics of constructor.

[2]

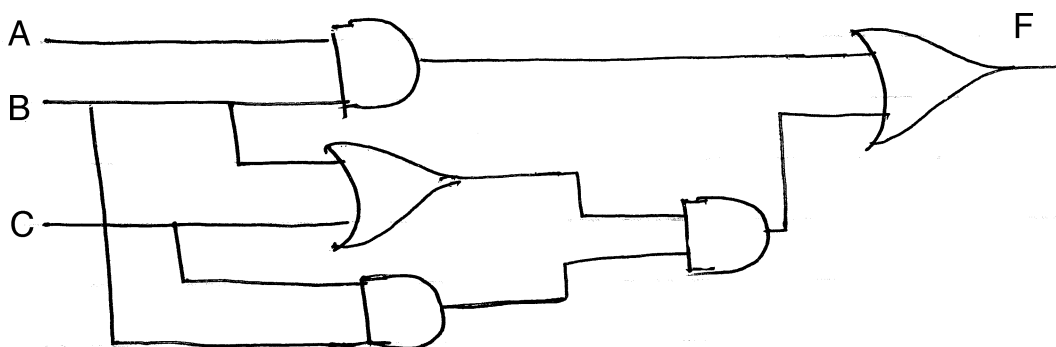


13. Consider the following declaration [2]  
`int sparse (int X[ ][10], int r1, int c1, int y[ ][3])`  
`{`  
    \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- `}`

Where x is a matrix of order r1\* c1, obtain the matrix y as the sparse of matrix x. The function return's total number of non zero elements.

14. Differentiate between actual arguments and formal arguments. [2]
15. Obtain the Postfix expression for the following infix expression. Show the contents of the stack after each step. [2]  
 $A + B * C + D/E$
16. State any two points of difference between text file and binary file. [2]
17. Write a user defined function in C++ to count and return the number of Alphabets in a text file named "sample.txt". [2]
18. Prove the following Boolean expression using, Boolean laws. [2]  
 $(x + y) \cdot (\bar{x} + z) \cdot (y + z) = (x + y)(\bar{x} + z)$

19. Write the equivalent Boolean expression for the following logic circuit diagram and reduce the Boolean expression into its simplified form using laws of Boolean algebra. [2]



20. Write a short note on Bus Topology. [2]
21. State two points of difference between LAN and WAN. [2]



SECTION – C

22. Write a complete procedural C++ program to generate the following pattern for N lines. If N = 4. [3]

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| 1 |   |   |   |   | 1 |
|   | 2 |   |   | 2 |   |
|   |   | 3 |   | 3 |   |
|   |   |   | 4 |   |   |

OR

22. Write a complete procedural C++ program to generate the following pattern for N lines If N = 4. [3]

```

* * * * *
 * * * * *
 * * *
 * *
 *
```

23. Write a user defined function named display ( ) in C++ to print the first N binary numbers, where N is passed as the argument to the function. (without using array) If N = 5 then function should display 0, 1, 10, 11, 100. [3]

24. Define a class REPORT in C++ with the following description. [3]

Private members :

- stream            array of 10 characters
- mo                of type integer
- name             array of 30 characters
- div                01 character
- grade            01 character
- remark           array of 30 characters
- getremark ( )   function which assigns remark based on the following conditions

| Remark                   | Condition                                   |
|--------------------------|---------------------------------------------|
| “Quality for next class” | If students secures a grade from ‘A’ to ‘G’ |
| “Needs improvement”      | If Students secures ‘H’ or ‘I’ grade        |



Public :

- input ( ) function to ask and store the value of rno, name, class, div, grade and called getremark ( ) function to assign remark.
- Display ( ) function to display all the data members neatly and clearly.

25. Given a binary file “Employee. DAT” containing records of the following class type. [3]

```
Class EPL
{
 Char Name [20];
 Char Address [20];
 Char Dept [20];
 float salary ;
Public :
 Void input () ;
 Void show () ;
 float check ()
 {
 return salary ;
 }
 int shield (char s [])
 {
 return strcmp (Dept, s) ;
 }
};
```

Write a function club ( ) in C++ that would copy all those records which are having Dept as “PERSONEL” and salary more than 50,000/- from “EMPLOYEE.DAT” to “FINAL. DAT”.

26. Obtain a simplified form for the following expression using K-map.

$$f(A, B, C, D) = \sum(1, 2, 3, 5, 6, 7, 9, 11, 12, 13, 15).$$

[3]

Also draw the logic circuit diagram for the simplified expression using NAND gates only.

#### SECTION – D

27. Define a abstract class named “BASE 1” having one private data member ‘X’ of integer type and parameterised constructor to initialise data member ‘X’ only. Define another abstract class named “BASE 2” having two private data members



'Y' of type float and 'Z' a character array of size 20. Define parameterised constructor to initialise its data members 'Y' and 'Z'. Derived a new class named "SWEET" from BASE 1 and BASE 2 in public mode. It consists of one protected data member 'W' of type character and parameterised constructor to initialise data member 'W'.

Write an appropriate main ( ) function which creates derived class object. [4]

OR

27. Define a class named "EGG" with the following specification.

Private :

- doz of type integer.
- no of type integer.
- Define a default constructor which accepts values for all the data members.
- Define a copy constructor which accepts two objects as parameters and initialises data members as per the summation of dozons of both the objects (Refer example below)
- Define member function show ( ) in public visibility label to display vlaues of data members of all the objects. Further write appropriate main ( ) function.

Example :

```
if obj 1 is 3 doz 8 numbers
 obj 2 is 4 doz 6 numbers
 obj 3 is 8 doz 2 numbers
```

28. Consider the following class declaration [4]

```
class LIST
{
 Struct node
 {
 int age ;
 node * Link ;
 } * START ;
 Public :
 LIST ()
 { START = NULL ; }
 void create () ;
 void insert () ;
 void display () ;
};
```

Write the function definition for the member function insert ( ) to insert a new node at any position in the linked list. Assume that the linked list contains N nodes.

OR



28. Consider the following class declaration

```
class LIST
{
 Struct node
 {
 int age ;
 node * link ;
 } * Start ;
Public:
LIST ()
{
 Start = NULL ;
}
void create () ;
void delet () ;
void show () ;
};
```

Write the function definition for the member functions delet ( ) to delete node at any position and function show ( ) to display the contains of linked list.

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