Series LPC16

कोड नं. **91**
Code No.

Roll No. | | | | | | | |

Candidates must write the Code on the title page of the answer book.

- Please check that this question paper contains **12** printed pages.
- Code number given on the right hand side of the question paper should be written on the title page of the answer book by the candidate.
- Please check that this question paper contains 7 questions.
- **Please write down the Serial Number of the question before attempting it.**
- 15 minutes time has been allotted to read this question paper. The question paper will be distributed at 10:15 a.m. From 10:15 a.m. to 10:30 a.m., the students will read the question paper only and will not write any answer on the answer-book during this period.

PRE BOARD EXAMINATION
COMPUTER SCIENCE

Time allowed : 3 hours *Maximum Marks : 70*

Instructions:-

(i) All questions are compulsory.

(ii) Programming Language : C++

1. (a) Differentiaie between actual and formal parameter with the help of examples. 2

(b) Which header file(s) will be essentially required to be included to execute the following C++ code? 1

```
void main()
{
int Eno = 123;
char EName[ ]= "CBSE AISSCE";
cout<<setw(5)<<Eno<<setw(25)<<Ename<<endl;
}
```

(c) Rewrite the following code after removing syntactical error(s), if any. Underline each correction made. 2

```
#include<iostream.h>
void main()
{
one = 10, two = 20;
call(one, two);
call(two);
}
void call(int n1, int n2 = 20)
{
n1 = n1 + n2
cout<<n1>>n2;
}
```

d. Go through the C++ code shown below and find the possible output from the suggested output options (i) to (iv):- 2

```
#include<iostream.h>
#include<stdlib.h>
const int LOW = 25;
void main( )
{
randomize( );
```

```
int num, point = 5;
for(int i = 1; i<=4; i++)
{
num = LOW + random(point);
cout<<num<<":";
point - -;
}
}
```

i. 29 : 26 : 25 : 28
ii. 24 : 28 : 25 : 26
iii. 29 : 26 : 24 : 28
iv. 29 : 26 : 25 : 26

(e) Find the output of the following program: 2

```
#include<iostream.h>
void switch1(int a[ ], int n, int split)
{
for(int k = 0; k < n; k++)
if(k < split)
a[k] += k;
else
a[k] *= k;
}
void display(int a[ ], int n)
{
for(int k = 0; k < n; k++)
(k % 2 = = 0) ? cout<<a[k]<<"%": cout<<a[k]<<endl;
}
void main( )
{
int h[ ] = {30, 40, 50, 20, 10, 5};
switch1(h, 6, 3);
display(h, 6);
}
```

f. Find the output of the following program : 3

```
#include<iostream.h>
struct Package
{
int L, b, h:
};
void occupy(Package M)
{
Cout<<M.L<<"x"<<M.b<<"x"<<M.h<<endl;
}
void main()
{
Package B1 = {100, 150, 50}, B2, B3;
++B1.L;
occupy(B1);
B3 = B1;
++B3.b;
B3.b++;
occupy(B3);
B2 = B3;
B2.b+=50;
B2.h- - ;
occupy(B2);
}
```

2. (a) What is an object with reference to Encapsulation? State the different ways to assign values to the data members of an object. 2

(b) Answer the questions (i) and (ii) after going through the following : 2

```
class Complex
{
int img;
int real;
public:
Complex( ); // function 1
```

```
Complex(int, int);//function 2
~Complex( );//function 3
};
```

(i) What is function 3 known as? When will it be invoked in a class?

(ii) Name the function 1 and function 2 and expand the function 2

(c) Define a class Ticket in C++ with following description: *4*

Data members :

Tno to type integer (Ticket number)

Name of type string(Passenger name)

Distance of type integer (distance to be travelled in kms)

Berth of type string("SL", "2AC", "3AC")

Psngr of type integer (no of passengers)

Fare of type float (Ticket fare)

A member function calcFare( ) to caluclate the fare as per the following :

Berth	Rate per km
SL	10
3AC	25
2AC	35

Service charges of ₹ 200/- for 2AC and 3AC

Public members

A member function Book( ) to enter Tno, Name, Distance, Berth, Psngr

A member function Print( ) to display Tno, Name, Distance, Bearth, Psngr and call calcFare( ) to calculate the journey fare.

(d) Consider the following and answer the following questions : *4*

```
class ADDRESS
{
char Hno[10];
char City[15];
proteched:
long Pincode;
public:
char phone[11];
ADDRESS( );
```

```
void get( );
void show( );
};
class OFFICE
{
char Name[15];
char Manager[20];
char code[10];
public:
int totalEmp;
OFFICE( );
void input( );
void output( );
};
class EMPLOYEE : private ADDRESS, public OFFICE
{
int lcode:
char Ename[25];
float Salary;
public :
char Dept[15];
EMPLOYEE( );
void getEmp( );
void showEmp( );
};
```

(i) Name the type of inheritance is shown in above example.

(ii) Write the names of all the member functions which are accessible from objects of class EMPLOYEE.

(iii) Write the name of all the members which are accessible from member functions of class EMPLOYEE.

(iv) How many bytes will be allocated to an object belonging to class EMPLOYEE?

3. (a) Write a function in C++ which accepts an integer array and its size as arguments and assigns the element into a 2D array of integer in the following format: . 3

e.g. If A[ ] contains 1, 2, 3, 4 Resultant array will be:

0 0 0 1
0 0 1 2
0 1 2 3
1 2 3 4

(b) An array A[5][5] is stored in the memory with each element occupying 4 bytes of space. Assume the Base Address of A to be 1000, compute the address of B[2][4], when the array is stored :

(i) Row Wise (ii) Column Wise 3

(c) Write a function in C++ to delete an element from a dynamically allocated Stack of Student implemented with the help of following structure : 4

```
struct Student
{
int Rollno;
char Name[20];
Student * Link;
};
```

(d) Write a function in C++ which accepts 2D integer array & its size as arguments and displays the elements which lies on the diagonals : 2

e.g. if the array is :

20 40 10
40 50 2
60 10 20

Output should be :

Diagonal 1 : 20 50 20
Diagonal 2 : 10 50 60

(e) Convert the following INFIX expression to equivalent POSTFIX expression. Show status of stack after every step of evaluation

A+B*(C-D)/E 2

4. (a) Fill in the blanks marked as Statement 1 and Statement 2 in the below code according to the context : *1*

```
#include<fstream.h>
class Customer
{
int Cno;
char Cname[20];
public :
//Function to count the total number of records
int Countrec( );
};
int Customer : : Countrec( )
{
fstream f;
f.open("Cust.dat", ios::binary|ios::in);
.....//statement 1
int Bytes = .....//statement 2
int count = Bytes / sizeof(Customer);
f.close( );
return count;
}
```

(b) Write a function in C++ to count number of words starting with "amend" in the text file named as "Amendment.txt" *2*

Eg.

A contract to deliver something to a customer once a month can be amended if the customer wants it delivered once a week. Usually, everyone involved in the contract must agrre to the amendment before it goes into effect. Most contracts are written with rules about amendments.

The output should be

No of words starting with amend : 3

(c) Following is the class of each record in a data file named "Employee.dat" : 3

```
class EMPLOYEE
{
int id;
Char name[15];
char desg[10];
public
void input( );
void output( );
};
```

Write a function in C++ to add a new employee's record in the file.

5. (a) Explain cardinality and degree with the help of examples. 2

Consider following tables SENDER and RECIPIENT :

Table : SENDER

SenderID	SenderName	Sender Address	SenderCity
ND01	R Jain	2, ABC Appts	New Delhi
MU02	H Sinha	12, Newton	Mumbai
MU15	S Jha	27/A, Park Street	Mumbai
ND50	T Prasad	12, Newton	New Delhi

Table : RECIPIENT

RecID	SenderID	RecName	RecAddress	RecCity
KO05	ND01	R Bajpayee	5,Central Avenue	Kolkata
ND08	MU02	S Mahajan	116, A Vihar	New Delhi
MU19	ND01	H Singh	2A, Andheri East	Mumbai
MU32	MU15	PK Swamy	B5, CS Terminus	Mumbai
ND48	ND50	S Tripathi	13, B1D, Mayur Vihar	New Delhi

(b) Write queries for the following statements : 4

(i) To display the name of all Senders from Mumbai

(ii) To display the RecID, SenderName, SenderAddress, RecName, RecAddress for every Receipient.

(iii) To display Receipient details in ascending order of RecName.

(iv) To display number of Receipients for each city.

(c) Give the output of the following queries: 2

(i) SELECT DISTINCT SenderCity FROM SENDER;

(ii) SELECT A.SenderID and B.RecCity = "Mumbai";

(iii) SELECT RecName, RecAddress FROM RECIPIENT WHERE RecCity NOT IN ("Mumbai", "Kolkata");

(iv) SELECT RecID, RecName FROM RECIPIENT WHERE SenderID = "MU02" OR SenderID = "ND50";

6. (a) Prove the following using Truth Table : 2

(i) $(A + B)' = A'.B'$ ii. $(A.B)' = A' + B'$

(b) Write the POS form of Boolean function G, Which is represented in a Truth Table as follows : 1

A	B	C	G
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	0

(c) Draw the equivalent Logic Circuit for the following Boolean Expression : 2

$(V' + V'.[W(U + V)]$

(d) Reduce the following Boolean expression using K-Map : 3

$F(P, Q, R, S) = m9 + m11 + m13 + m14 + m15$

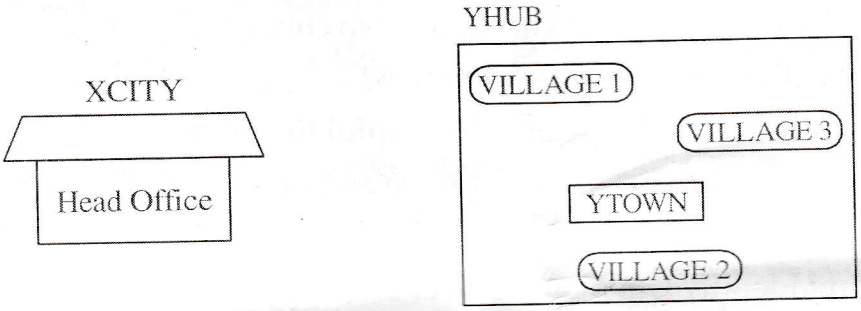
7. (a) Write one example each of Open & Proprietary softwares. *1*

(b) Explain FTP. *1*

(c) What do you understand by Cyber Law. *1*

(d) Intelligent Hub India is a knowledge community aimed to uplift the standard of skills and knowledge in the society. It is planning to set up its training centers in multiple towns and villages pan India with its head offices in the nearest cities. They have created a model of their network with a city, a twon and 3 villages as follows.

As a network consultant, you have to suggest the best network related solutions for their issues/problems raised in (i) to (iv), keeping in mind the distances between various locations and other given parameters :



Shortest distances between various locations :

VILLAGE 1 to YTOWN	2 KM
VILLAGE 2 to YTOWN	1.5 KM
VILLAGE 3 to YTOWN	3 KM
VILLAGE 1 to VILLAGE 2	3.5 KM
VILLAGE 1 to VILLAGE 3	4.5 KM
VILLAGE 2 to VILLAGE 3	3.5 KM
CITY Head Office to YHUB	30 KM

Number of computers installed at various locations are as follows :

YTOWN	100
VILLAGE 1	10
VILLAGE 2	15
VILLAGE 3	15
CITY OFFICE	5

Note : In villages, there are community centers, in which one room has been given as training center to this organization to install computers.

The organization has got financial support from the government and top IT companies

(i) Suggest the most appropriate location of the SERVER in the YHUB (Out of the 4 locations), to get the best and effective connectivity. Justify your answer. 1

(ii) Suggest the best wired medium and draw the cable layout (location to location) to efficiently connect various locations within the YHUB. 1

(iii) Which hardware device will you suggest to connect all the computers within each location of YHUB? 1

(iv) Which service/protocol will be most helpful to conduct live interactions of Experts from Head Office and people at YHUB locations. 1

(e) Out of following identify Client and server side script(s) : *1*

(i) ASP (ii) Javascript (iii) JSP (iv) VBScript

(f) Write one advantage of Star Topology over Bus Topology. *1*

(g) State the challenges associated with cloud computing. *1*

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