**Series LPC17**

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.

# II PRE BOARD EXAMINATION
# COMPUTER SCIENCE

*Time allowed : 3 hours* *Maximum Marks : 70*

*Instructions:-*

*(i) All questions are compulsory.*

*(ii) Programming Language : C++*

1. (a) When a function is overloaded, there are multiple definitions of the functions. What makes the various definitions of the function different from each other? 2

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

```
void main()
{
int Rno = 465;
char SName[ ]= "Ajay Bhaskar";
cout<<setw(6)<<Rno<<setw(25)<<Sname<<endl;
}
```

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

```
#include<iostream.h>
struct Screen
{
int C, R;
}
void ShowPoint(Screen P)
{
cout<<P.C, P.R<<endl;
}
void main( )
{
Screen Point1 = (5 , 3);
ShowPoint(Point1);
Screen Point2 = Point1;
C./Point1 += 2;
Point1.R = Point1.R + 2;
}
```

d. Find the output of the following program: 2

```
#include<iostream.h>
void ChangetheContent(int Arr[ ], int Count)
{
For(int C = 0; C < Count; C++)
Arr[C] = Arr[Count - C - 1];
}
void main( )
{
int A[ ] = {1, 2, 3}, B[ ] = {20, 30, 40, 50}, C[ ] = {100, 200};
ChangetheContent(A, 3);
ChangetheContent(B, 4);
ChangetheContent(C, 2);
for(int L = 0; L <3; L++)cout<<A[L]<<'#';
cout<<endl;
for(int L = 0; L <4; L++)cout<<B[L]<<'#';
cout<<endl;
for(int L = 0; L <2; L++)cout<<C[L]<<'#';
cout<<endl;
}
```

(e) Give the output of the following program (Assuming that all required header files are included in the program): 2

```
void main( )
{
char a[ ] = "Exam=2011 AheAd";
int i;
for(i = 0; a[i]!='\0';i++)
{
if(a[i]>=97 && a[i] <= 122)
```

```
a[i]--;
else if(a[i] >= '0' && a[i] <= '9')
a[i] = a[i - 1];
else if a[i] >= 'A' && a[i] <= 'Z')
a[i] += 32;
else
a[i] = '#';
}
puts(a);
}
```

f. Study the following program and select the possible output from it : 2

```
#include<iostream.h>
#include<stdlib.h>
const int LIMIT = 4;
void main( )
{
randomize( );
int Points;
Points = 100 + ramdom(LIMIT);
for(int P = Points; P >= 100; P--)
cout<<P<<'#';
cout<<endl:
}
```

i. 103#102#101#100# ii. 100#101#102#103#

iii. 104#103#102#101# iv. 103#102#101#100

2. (a) What is copy constructor and parameterized constructor? Illustrate with an example. 2

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

```
class mammal
{
public:
char category[20];
mammal(char xname[ ] )//function1
{
strcpy(category, xname)
}
mammal(mammal &t);    //function 2
};
```

(i) Create an object, such that it invokes function1.

(ii) Write complete definition for function2.

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

**Private members :**

- SCode of type long
- SName of type character array (String)
- Fees of type integer
- Duration of type integer

**Public members :**

- Constructor to assign initial values of SCode as 1001, SName as "Cricket", Fees as 500, Duration 70
- A function NewSports( ) which allows user to enter SCode, SName and Duration.

Also assign the values to Fees as per the following conditions :

| SName | Fees |
|---|---|
| Table Tennis | 2000 |
| Swimming | 4000 |
| Football | 3000 |

- A function DisplaySports( ) to display all the details.

(d) Consider the following declarations and answer the questions given below:

```
class NATION
{
int H;
protected:
int S;
public:
void INPUT( )
void OUTPUT( );
};
class WORLD: private NATION
{
int T;
protected:
int U;
public:
void INDATA(int, int);
void OUTDATA( );
};
class STATE: public WORLD
{
int M;
public:
void DISPLAY(void);
};
```

(i) Name the base class and derived class of the class WORLD.

(ii) Name the data member(s) that can access from function DISPLAY( ).

(iii) Name the member function(s) which can be accessed from the objects of class STATE.

(iv) Is the member function OUTPUT( ) accessible by the objects of the class WORLD.

3. (a) Consider the following structure :

```
struct Employee
{
int ECode;
char Ename[20];
};
```

Write a function to accept an employee array and perform Bubble sort in the increasing order of ECode. 3

(b) An array MAT[10][11] is stored in the memory row wise with each element occupying 4 bytes of memory. Find out the base address and the address of element MAT[5][10], if the location of MAT[1][4] is stored at the address 2000. 3

(c) Write a function in C++ which accepts an integer array and its size as arguments and replaces elements having odd values with thrice its value and elements having even values with twice its values. 4

**Example :** if an array of five elements initially contains the elements as :

3, 4, 5, 16, 9

(d) Evaluate the following postfix expression using a stack and show the contents of the stack after each operation 2

100 40 8 + 20 10 – + *

4. (a) Observe the program segment given below carefully and fill the blanks marked in statement 1 using seekg( ) or seekp( ) functions for performing the required task. 1

```
#include<fstream.h>
class FILE
{
int Num;
char Name[30];
public :
void GO_Record(int);
};
```

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```
struct Employee
{
int ECode;
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```

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4. (a) Observe the program segment given below carefully and fill the blanks marked in statement 1 using seekg( ) or seekp( ) functions for performing the required task. 1

```
#include<fstream.h>
class FILE
{
int Num;
char Name[30];
public :
void GO_Record(int);
};
```

```
//function to read Nth record from the file
void FILE : : GO_REcord(int N)
{
FILE Rec;
fstream File;
File.open("STOCK.dat", ios::binary|ios::in);
_____ //statement 1
File.read((char*)&Rec,sizeof(Rec));
cout<<Rec.Num<<Rec.Name<<endl;
File.close( );
}
```

(b) Write a function to count and print the number of complete words as "to" and "are" stored in a text file "ESSAY.TXT". 2

(c) Write a function in C++ to display object from the binary file "PRODUCT.DAT" whose product price is more than ₹ 200. Assuming that binary file is containing the objects of the following class : 3

```
class PRODUCT
{
   int PRODUCT_no;
   char PRODUCT_name[20];
   float PRODUCT_price;
   public:
   void enter( )
   {
   cin>>PRODUCT_no;
   gets(PRODUCT_name);
   cin>>PRODUCT_price;
   }
   void display( )
   {
   cout<<PRODUCT_no;
```

```
cout<<PRODUCT_name;
cout<<PRODUCT_price;
}
int ret_Price( )
{
return PRODUCT_price;
}
};
```

5. (a) What are DDL and DML commands? Give one example of each. 2

(b) Consider the following tables stationary and consumer. Write SQL commands for the statement (i) to (iv). 4

***Table : Stationary***

| S_ID | StationaryName | Company | Price |
|---|---|---|---|
| DP01 | Dot Pen | ABC | 10 |
| PL02 | Pencil | XYZ | 6 |
| ER05 | Eraser | XYZ | 7 |
| PL01 | Pencil | CAM | 5 |
| GP02 | Gel Pen | ABC | 15 |

***Table : Stationary*** Consumer

| C_ID | ConsumerName | Address | S_ID |
|---|---|---|---|
| 01 | Good Learner | Delhi | PL01 |
| 06 | Write Well | Mumbai | GP02 |
| 12 | Topper | Delhi | DP01 |
| 15 | Write & Draw | Delhi | PL02 |
| 16 | Motivation | Bangalore | PL01 |

(i) To display the details of those consumers whose address is Delhi.

(ii) To display the details of Stationary whose Price is in the range of 8 to 15. (Both value included).

(iii) To display the ConsumerName, Address from Table Consumer and Company and Price from table Stationary, with their corresponding matching S_ID.

(iv) To increase the Price of all stationary by 2.

(c) Write the output for SQL queries (v) to (viii): 2

(v) SELECT DISTINCT Address FROM Consumer;

(vi) SELECT Company, MAX(Price), MIN(Price), COUNT(*) from Stationary GROUP BY Company;

(vii) SELECT Consumer.ConsumerName, Statinary.StationaryName, Stationary.Price FROM Stationary, Consumer WHERE Consumer.S_ID = Stationary.S_ID;

(viii) Select StationaryName, Price*3 from Stationary;

(d) What do you understand by the terms Alternate Key and Foreign Key of a relation?

6. (a) Verify the following algebraically : 2

$(A' + B').(A + B) = A'.B + A . B'$ 2

(b) Draw a logical circuit diagram for the following Boolean Expression : 2

$A . (B + C')$

(c) Write the equivalent Canonical Sum of product for the following product of sum expression :

$F(X, Y, Z) = \pi(1, 3, 6, 7)$ 1

(d) If $F(X, Y, Z, W) = \Sigma(0, 1, 3, 4, 5, 7, 9, 10, 11, 13, 15)$ obtain the simplified form using K-Map.

7. (a) What was the role of ARPANET in the Computer Network? 3

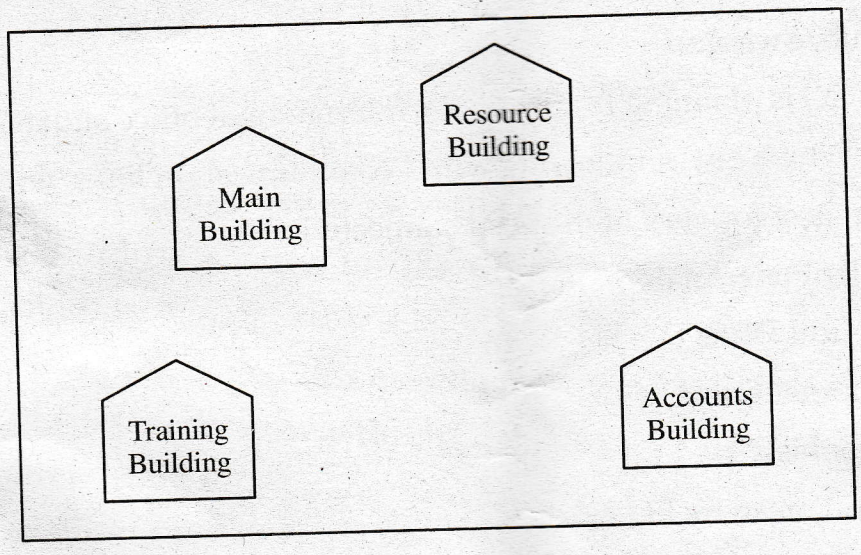
(b) Define the term Bandwidth. Give any one unit of Bandwidth. 2

(c) Write the full form of the following : 1

i. FTP 1

ii. NTP

(d) "Vidya for All" is an educational NGO. It is setting up its new campus at Jaipur for its web based activities. The campus has four buildings as shown in diagram below : 4




Center to center distances between various buildings as per architectural drawings (in meters) is as follows :

| | |
|---|---|
| Main Building to Resource Building | 120 m |
| Main Building to Training Building | 40 m |
| Main Building to Accounts Building | 135 m |
| Resource Building to Training Building | 125 m |
| Resource Building to Accounts Building | 45 m |
| Training Building to Accounts Building | 110 m |

Expected number of computers in each building is as follows :

| | |
|---|---|
| Main Building | 15 |
| Resource Building | 25 |
| Training Building | 250 |
| Accounts Building | 10 |

(i) Suggest a cable layout of connection between the buildings.

(ii) Suggest the most suitable place (i.e. building) to house the server of this NGO. Also provide a suitable reason for your suggestion.

(iii) Suggest the placement of the following devices with justification :

a. Repeater

b. Hub/Switch

(iv) The NGO is planning to connect its International office situated in Delhi. Which out of following wired communication links, will you suggest for very high speed connectivity?

a. Telephone Analog Line

b. Optical Fibre

c. Ethernet Cable

(e) What are cookies? 1

(f) What do you mean by FLOSS? 1

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