

**COMMON PRE-BOARD EXAMINATION 2017-2018**  
**COMPUTER SCIENCE**

**CLASS XII**

Time Allowed: 3 hours

Maximum Marks: 70

General Instructions:

- Please check that this question paper contains 9 printed pages.
- Please check that this question paper contains 7 questions.
  - SECTION A: C++.
  - SECTION B: Databases, SQL, Boolean algebra and Communication & Networking.
- All questions are compulsory within each section.
- Please write down the Serial Number of the question before attempting it.
- 15 minute time has been allotted to read this question paper, the students will read the question paper only and will not write any answer on the answer-book during this period.

**SECTION – A**

1. (a) Bring out the difference between type casting and type conversion. Also identify to which of the two does the below code snippet belongs to: 2

```
void main()
{
    int a=3;
    float b;
    b=a;
}
```

- (b) During the compilation of the following code three errors were found as below: 1
- Function setprecision() should have prototype
  - Undefined symbol cout

Write the names of the header files, which needs to be included, for the successful compilation and execution of following code:

```
void main(){
    double x=125.892145;
    cout<<setprecision(2)<<x;
}
```

- (c) Rewrite the following C++ code after removing any/all syntactical errors with each correction underlined. 2

Note: Assume all required header files are already being included in the program.

```

typedef char[30] string;
void main(){
s string;
for(i=0,i<10,i++)
s[i]=65+i;
s[i]='\0';
cout<<s;}

```

- (d) Find and write the output of the following C++ program code :

2

Note: Assume all required header files are already included in the program.

```

void main( ){
int *PointerArray[10];
int index = 0, I;
int marks [ ] = {75, 68, 90, 74, 0, 10, 90, 65};
clrscr();
for (I = 0; marks [I]!=0; I++)
{
PointerArray [I]=&marks[I];
* (PointerArray[I]) += 5;
while(index<I)
{
int p=*(PointerArray[index] );
if(p>=60)
cout<<p<< "@";
index ++;
}
}
}

```

- (e) Find and write the output of the following C++ program code :

3

Note: Assume all required header files are already being included in the program.

```

class publication{
char matter[30];
int price;
public:
publication()
{
strcpy(matter,"School-Times");
price=5000;
}
publication(char m[ ])
{
strcpy(matter,m);
price=4000;
}
publication(int p)
{
strcpy(matter,"School Fair Details");
price=5000-p;
}
}

```

```

void Enter(char m[],int p)
    {
        strcpy(matter,m);
        price=price+p;
    }
void Enter(int p=2000)
    { price=price+p; }
void Headline(char m[],int p)
    { strcpy(matter,m);
      price=price+p;}
void Display()
{ cout<<matter<<"@"<<price<<endl; }
};
void main(){
    publication p1,p2(1000),p3("Christmas Carols"),p4;
p1.Display();
p2.Display();
p1.Headline("School-DJ",2000);
p1.Display();
p2.Enter("Fair Picnic",2500);
p2.Display();
p3.Enter();
p3.Display();
p4=p2;
p4.Display();}

```

- (f) Observe the following program & find out the correct possible outputs from the options. 2  
 (Assuming that all required header files are included in the program):-

```

void main() {
char Sections[ ][10] = {"12-A", "12-B", "12-C", "12-D", "12-E", "12-F" };
randomize();
for(int i=0 ; i<4 ; i++)
cout<<Sections[sizeof(char) + random(3)+1] ;
}

```

- (i) Out of the six Sections stored in the array Sections, which Sections will never be displayed in output?
- (ii) Mention the minimum and maximum value of the index assigned to the string array Sections inside the loop.

2. (a) Differentiate between a private and public visibility mode in a class? If a base class and a derived class each include a member function (in public section) with the same name and arguments, which member function will be called by the object of the derived class if the scope operator is not used? 2

- (b) Answer the question (i) & (ii) after going through the following code. (Assume all necessary header files are included in program):- 2

```

class Exam{
char Subject[20] ;
int Marks ;
public :

```

```

Exam() // Function 1
{
strcpy(Subject, "Computer" );
Marks = 0 ;
}
Exam(char P[ ]) // Function 2
{
strcpy(Subject, P) ;
Marks=0 ;
}
Exam(int M) // Function 3
{
strcpy(Subject, "Computer" );
Marks = M ;
}
Exam(char P[ ], int M); // Function 4
};

```

- (i) Which feature of the Object Oriented Programming is demonstrated using Function 1, Function 2, Function 3 and Function 4 in the above class Exam?
- (ii) Write the complete definition of Function 4.

(c) Define a class **worker** with the following specification: 4

*Private members of class worker*

wname            25 characters  
hrwrk, wgrate    float (hours worked and    wagerate per hour)  
totwage           float(hrwrk\*wgrate)  
calcwg            A function to find hrwrk\* wgrate with float return type

*Public members of class worker*

in\_data()        a function to accept values for wno, wname, hrwrk, wgrate and invoke calcwg() to calculate totwage.  
out\_data()        a function to display all the data members on the screen

(d) Consider the following class definition and answer the questions give below: 4

```

class MNC
{
char Cname[25]; //Compay name
protected:
char Hoffice[25]; //Head office
public:
MNC();
char Country[25];
void EnterData();
void DisplayData();
};
class Branch:public MNC
{
long NOE //Number of employees
char Ctry[25]; //Country

```

```

protected:
void Association();
public:
Branch();
void Add();
void Show();
};
class Outlet:public Branch
{
char State[25];
public:
Outlet();
void Enter();
void Output(); };

```

- (i) Which class constructor will be called first at the time of declaration of an object of class Outlet?
- (ii) How many bytes does a object belonging to class Outlet require?
- (iii) Name the member function(s), which are accessed from the object(s) of class Outlet.
- (iv) Name the data member(s), which are accessible from the object(s) of class Branch.

3. (a) Write a function TRANSFER(int A[], int B[], int Size) in C++ to copy the elements of array A into array B in such a way that all the negative elements of A appear in the beginning of B, followed by all the positive elements, followed by all the zeroes maintaining their respective orders in array A. 2

*For example:*

If the contents of array A are:

7, -23, 3, 0, -8,-3,4, 0

The contents of array B should be

-23 , -8, -3, 7, 3, 4, 0

- (b) An array S[40][30] is stored in the memory along the row with each of the element occupying 2 bytes, find out the memory location for the element S[20][10], if an element S[15][5] is stored at the memory location 5500. 3
- (c) Write the definition of a member function PUSH\_STACK() for a class STACK in C++, to insert the details of TOY in a dynamically allocated Stack of Toys considering the following code is already written as a part of the program. 4

```

struct TOY
{
int toycode;
char toytype[20];
TOY *next;};
class STACK
{
TOY *TOP;
public :
STACK() {TOP=NULL;}
void PUSH_STACK();
void POP_STACK();
~STACK();
};

```

- (d) Write a function REVERSE\_ELEMENT (int mat [ ][3], int N, int M) in C++ to display the reverse of all the elements from a two dimensional array named 'mat' of size MxN. 3

*For example:*

You have entered the Matrix :-

45 67 22

98 45 12

56 17 82

Output should be:

Reverse of every element in Matrix:-

54 76 22

89 54 21

65 71 28

- (e) Evaluate the following POSTFIX expression. Show the status of Stack after execution of each operation separately: **TRUE FALSE OR FALSE TRUE AND NOT OR** 2

4. (a) A binary file "Students.dat" contains data of 4 students where each student's data is an object of the following class: 1

```
class Student  
{ int Rno ; char Name[20] ;  
public:  
void EnterData ( ) { cin>>Rno ; gets(Name) ;  
void ShowData ( ) { cout<<Rno<<" - "<<Name<<endl ; }  
};
```

With reference to this information, give the output of the following program segment(assume all necessary declarations are given):

```
void main(){  
    ifstream File;  
    File.open("STUDENTS.DAT" , ios::binary | ios::in);  
    while(File){  
        File.read((char*)&S, sizeof(S));  
        File.read((char*)&S, sizeof(S));  
        if(File.eof())  
            break;  
        else  
            cout<<"\n"<<File.tellg();  
    }  
}
```

- (b) Write a function in C++ named RevText() to read a text file "Input.txt" and print only word starting with the letter 'I' in reverse order. 2

*Example:*

If value in text file is: INDIA IS MY COUNTRY

Output will be: AIDNI SI MY COUNTRY

- (c) Write a function CALSAL( ) in C++ to display the details of the employee and also the total number of employers who are paid salary in range 20000-50000 (inclusive of both) in the company. The worker's detail of this company is stored in a binary file WORKERS.DAT. Assume that the file WORKERS.DAT is created with the help of objects of class WORKER, which is defined below : 3

```

class WORKER
{
int WID; char Name[20];
float Salary;
public:
void INPUT() {cin>>WID;gets(Name);cin>>Salary;}
void OUTPUT() {cout<<WID<<": "<<Name<<endl; cout<<Salary<<endl; }
float GetSal() {return Salary;}
};

```

**SECTION – B**

5. (a) Observe the following Table and answer the parts (i) and (ii) accordingly:-

2

Table : DEPT

DCODE	DEPARTMENT	LOCATION
D01	INFRASTRUCTURE	DELHI
D02	MARKETING	DELHI
D03	MEDIA	MUMBAI
D05	FINANCE	KOLKATA
D04	HUMAN RESOURCE	MUMBAI

- (i) In the above table, can we take DCODE as Primary Key? (Answer in YES/NO only). Justify your answer with a valid reason.
- (ii) If a new column ‘NumberofStudents’ is added to the above table and also 5 more records inserted, then what is the degree and the cardinality of the new table ?

(b) Write SQL queries for (i) to (iv) and find outputs for SQL queries (v) to (viii), which are based on the following tables. 6

Table : EMPLOYEE

EMPLOYEEID	NAME	SALES	JOBID
E1	SAMIT SINHA	1100000	102
E2	VIJAY SINGH TOMAR	1300000	101
E3	AJAY RAJPAL	1400000	103
E4	MOHIT RAMNANI	1250000	102
E5	SHAILJA SINGH	1450000	103

Table : JOB

JOBID	JOBTITLE	SALARY
101	President	200000
102	Vice President	125000
103	Administration Assistant	80000
104	Accounting Manager	70000
105	Accountant	65000
106	Sales Manager	80000

- (i) To display details of the employers from the employee table in descending order of sales.
- (ii) To display employee id and name of those employee who have 'SINGH' (anywhere) in their names.
- (iii) To display employee ids, names of employees, job ids with corresponding job titles from employee and job table whose salary is in the range 70000-200000(inclusive of both values).
- (iv) To display the employee id, name and Commission for each employee (Commission is 5% of sales) who are having sales more than 1200000. The column name should be 'Comm'.
- (v) **SELECT COUNT (DISTINCT JOBID) FROM EMPLOYEE;**
- (vi) **SELECT EMPLOYEEID, NAME FROM EMPLOYEE E, JOB J WHERE E.JOBID=J.JOBID AND J.JOBID=102;**
- (vii) **SELECT MIN(SALARY), MAX(SALARY) FROM JOB;**
- (viii) **SELECT JOBID , SUM(SALARY) FROM EMPLOYEE GROUP BY JOBID HAVING COUNT(\*)>1 ;**

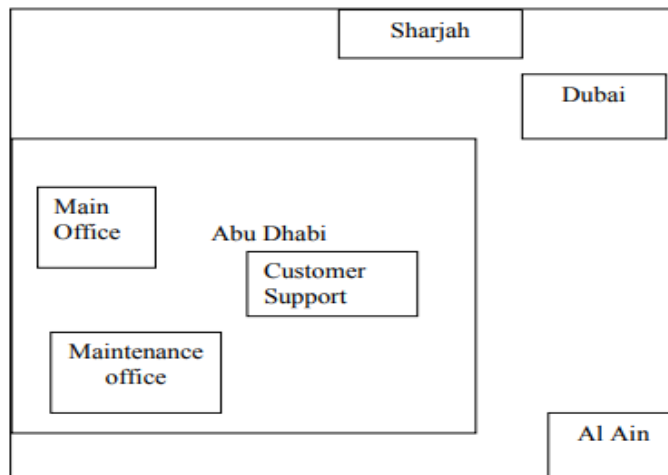
6. (a) State and verify Absorption law algebraically. 2
- (b) Draw the equivalent Logic Circuit for the following Boolean Expression using only NAND gates: 2  

$$F(A,B)=(A.B)+(A'.B')$$
- (c) A Boolean function F defined on three input variable X,Y,Z is 1 if and only if the number of 1(One) input is odd (e.g. F is 1 if X=1,Y=0,Z=0). Draw the truth table for the above function and express it in canonical sum of product form. 1
- (d) Reduce the following Boolean Expression to its simplest form using K-Map : 3  

$$F(X,Y,Z,W) = \Sigma(0,1,3,4,5,6,7,9,10,11,13,15)$$
7. (a) State any two reasons for which you may like to have a network of computers instead of having stand alone computers. 1
- (b) Name the protocol for the following: 1
- (i) Used to transfer voice using packet switched network
  - (ii) Used for chatting between two groups or two individuals
- (c) Give one merit and demerit each of the Star topology. 1
- (d) Manjushree is a web developer. She has designed a login form to input the login id and password of the user. She wants to write a code to check whether the login and the corresponding password as entered by the user are correct or not. Which one from the following will be most suitable for doing the same? (i) JSP (ii) Client side Script (iii) VBScript 1
- (e) What is the difference between Trojan Horse and Worm? 1
- (f) What is open source software? Name any one open source operating system. 1



- (g) A National Networking company is planning to start their offices in four cities of UAE to provide regional IT infrastructure support in the field of Culture and Education. The company has planned to set up their head office in Abu Dhabi in three locations and have named their Abu Dhabi Offices as “Customer Support”, “Main Office” and “Maintenance office”. The company’s regional offices are located at “Dubai”, “Sharjah” and “Al Ain” A rough layout of the same is as follows:



Approximate distance between these offices as per network survey team is as follows:

From	To	Distance
Main Office	Customer Support	5 Km
Main Office	Maintenance Office	1 Km
Main Office	Dubai Office	180 Km
Main Office	Al Ain Office	130 Km
Main Office	Sharjah Office	225 Km

In continuation of the above, the company experts have planned to install the following number of computers in each of their offices:

Main Office	110
Customer Support	25
Maintenance Office	55
Al Ain Office	55
Dubai	55
Sharjah	55

- i) Suggest network type (out of LAN, MAN, WAN) for connecting each of the following set of their offices:
  - Main Office and Maintenance Office
  - Main Office and Sharjah Office
- ii) Which device you will suggest to be procured by the company of connecting all the computers within each of their offices out of the following devices?
  - Modem
  - Telephone
  - Switch/Hub
- iii) Suggest the most suitable building to install the server of this organization with a suitable reason, with justification.
- iv) Suggest a cable/wiring layout for connecting the company’s local offices located in Abu Dhabi. Also suggest an effective transmission medium for connecting the company’s regional offices “Al Ain”, “Dubai” and “Sharjah”.