

KENDRIYA VIDYALAYA SANGATHAN, CHENNAI REGION
CLASS XII – COMMON PRE-BOARD EXAMINATION – 2016-17

SUBJECT:COMPUTER SCIENCE (083)

TIME ALLOTTED :3 HOURS

MAXIMUM MARKS:70

Instructions:

All questions are compulsory

Programming Language: C++

- 1a Which of the following identifiers can be used for naming variable or functions in C++? 2
Count4, Macro, 1stMark, avg*mark, _max, Break, max value, case
- b Gayathri has started learning C++ and has typed the following program. When she 1
compiled the following code, she understood that some header files. Write the names of
those header files, which are required to be included in the code.
void main()
{
float b,c;
char *str;
cin>>b;
gets(str);
c=fabs(b);
cout<<str<<endl<<b;
}
- c Rewrite the following code after removing any/all syntactical errors with each correction 2
underlined.
Note: Assume all header files are already being included in the program.
typedef line[80] char
void main()
{
int a=b=10;
quote = "Hardwork Counts";
cout<<"Length is "<<strlen(quote),a;
}
- d Find and write the output of the following program code: 2
Note: Assume all required header files are already included in the program
void main()
{
char *NAME="KAyaMAt!";
for(int x=0;x<strlen(NAME);x++)
if(x%2)
NAME[x]=tolower(NAME[x]);
else
if(isupper(NAME[x]))
NAME[x]+=1;
else
NAME[x]=NAME[x-1];
cout<<NAME;
}
- e Find and write the output of the following program code: 3
Note: Assume all required header files are already included in the program

```

class Lottery
{
    long id;
    int tkt, rate;
    char brand[40];
public:
    Lottery()
    {
        id=tkt=0;
        rate=0;
        strcpy(brand, "Onam Bumper");
    }
    void Register(int n, int r=1000)
    {
        id=n; rate=r;
        strcat(brand, " Reg.");
    }
    void Alter(int t, int r)
    {
        rate+=r;
        strcat(brand, "\\Altered\\");
    }
    void Show()
    {
        cout<<"ID:"<<id<<"RATE@"<<rate<<"BRAND#"<<brand<<endl;
    }
};
void main()
{
    Lottery lotA, lotB, lotC;
    lotA.Register(1, 4050);
    lotB.Register(10);
    lotA.Show();
    lotB.Show();
    lotC.Show();
    lotA.Alter(5, 505);
    lotC.Alter(10, 2000);
    lotA.Show();
    lotB.Show();
    lotC.Show();
    getch();
}

```

- f Look at the following C++ code and find the possible output(s) from the options (i) to (iv) 2 following it. Also write the maximum and the minimum values that can be assigned to the variable MODIFIER

Note:

Assume all the required header files are already being included in the code

```

void main()
{
    randomize();
    clrscr();
    int MODIFIER=random(4);
    char MEDALS[][25]={"PLATINUM","GOLD","SILVER","BRONZE"};
    for(int i=0;i<MODIFIER;i++)
    {
        for(int j=0;j<=i;j++)
            cout<<MEDALS[j];
    }
    cout<<endl;
}
}

```

(i)	(ii)
PLATINUM PLATINUMGOLD	GOLD GOLDSILVER GOLDSILVERBRONZE
(iii)	(iv)
PLATINUM PLATINUMGOLD PLATINUMGOLDBRONZE	PLATINUM PLATINUMGOLD PLATINUMGOLDSILVER PLATINUMGOLDSILVERBRONZE

2 a Differentiate between abstract and concrete class with respect to Object Oriented Programming structure. 2

b Observe the following C++ code and answer the questions (i) and (ii). Assume all necessary files are included:

```

class Drama
{
    char Name[40];
    float ticket;
int duration;
public:
    Drama(); //function 1
    Drama(char *,float); //function 2
    Drama(Drama &); //function 3
    void input();
    void output();
};

```

(i) What concept is been implemented in function 1,2&3 put together? Write a statement to create an object by calling function 2. 1

(ii) Write definition for function 3 and also state which type of function it is? 1

c Write the definition of a class Toll in C++ following description: 4

Private members

-REG an integer for code of vehicle

-TYPE – an string denoting vehicle type

-JOURNEY- an integer value 0 means SINGLE , 1 means RETURN

- FARE- integer to store fare

-CalFare()- to calculate fare depending upon the following condition.

VEHICLE	JOURNEY	
	SINGLE	RETURN
CAR, JEEP, VAN	53	80
TRUCK, BUS	75	110
TRAILORS	120	200

Public Members

-Enter() – a function to allow user to enter reg, type and journey(single/return as 0/1) and call CalDen() to assign the fare.

-View() – to display all the data members and also to display a message “Thank You Visit Again ” if its SINGLE journey.

d Answer the question below on the following classes

4

```

class School
{
    int id;
    char name[20];
protected:
    int affno;
public:
    School();
    void Reg();
    void TC();
};
class College
{
    int cid;
    char cname[20];
protected:
    int ccode;
public:
    College();
    void Reg();
    void TC();
};
class Institution:protected School,private College
{
    char *iname;
    int income();
public:
    Institution();
    void Enter();
    void Display();
};

```

- i) Which type of Inheritance is depicted in the above classes?
- ii) Write the names all member functions accessible by the object of Institution.
- iii) What would be the size of an object of Institution?
- iv) How does the ambiguity been resolved if Reg() of College has to be called by member function of Institution.

- 3 a Write the definition of function Merge(intA[10],intB[10],int C[20],intn,int m) in C++, which should merge the elements of arrays A(in ascending order), B(in descending order) in ascending order in C 2
- b S[20][50] is a two dimensional array, which is stored in the memory along the column with each of its member occupying 8 bytes, find the address of the element S[10][15] if the element S[15][10] is stored at the memory location 38000 3
- c Write the definition of a member function INSERT() and DELETE() of class QUEUE in C++, to insert a player in a dynamic queue of Players considering the following code is already written as a part of the program 4
- ```

struct Player
{
int PID;
char *PName;
float Point;
Player *next;
};
class QUEUE
{
PLAYER *rear, *front;
public:
QUEUE () {rear = front = NULL; }
void INSERT();
void DELETE();
~QUEUE();
};

```
- d Write definition for a function SumDiag(int P[][15], int N) in C++ to display the sum of positive elements on the left and right diagonals from two dimensional square matrix. 3
- e Evaluate the postfix expression 2
- 10 20 + 25 15 - \* 30 /
- 4 a Find the output of the following C++ code considering that the binary file EMP.dat exists on the harddisk with the data of 1500 employees. 1
- ```

class Employee
{
int code;char Name[25],Desig[30];float Salary;
public:
void Reg();void Show();
}E;
void main()
{
fstream f("Emp.dat",ios::binary|ios::in);
f.read((char *)&E,sizeof(E));
long pos = f.tellg();
cout<<"Rec:Before"<<pos/sizeof(E)<<endl;
f.seekg(pos+2*sizeof(E), ios::beg);
f.read((char *)&E, sizeof(E));
cout<<"Rec:Later"<<f.tellg()/sizeof(E);
f.close();
}

```

- b Write a function in C++ to display all the five letter words in a text file named "STORY.TXT". 2

Eg:

When I was a small child, I used to play in the garden with my grand mom. Those days were amazingly funful and I remember all the moments of that time

Output:

Five letter words are:
Small child grand Those

- c Given a file PHONE.DAT containing records of the following class type 3
class Phonelist

```
{
    char name[10], addr[30],area[20];
    long intphno;
public:
    void Register();
    void Show();
int CheckCode(char AC[])
    {
        return strcmpi(Area,AC);
    }
};
```

Write a function TRANSFER() in C++ that could copy all these records which are having Area as "Mumbai" from Phone.dat to PMumbai.dat.

- 5 a Differentiate between primary key and alternate key with suitable examples. 2
b Consider the following tables:

APPLICANTS

NO	NAME	FEE	GENDER	C_ID	DATEOFJOIN
1012	AMANDEEP	30000	M	A01	2012-01-02
1102	AVISHA	25000	F	A02	2009-03-24
1103	EKANT	30000	M	A02	2011-11-04
1049	ARUN	40000	M	A02	2009-05-06
1025	AMBER	30000	M	A02	2011-11-03
1106	ELA	40000	F	A05	2010-11-12
1017	NIKITA	35000	F	A03	2012-12-04
1108	ARLEENA	30000	F	A03	2012-10-01
1101	SHAKTHI	25000	M	A04	2011-03-23

COURSES

C_ID	C_NAME
A01	FASHION DESIGN
A02	NETWORKING
A03	HOTEL MANAGEMENT
A04	EVENT MANAGEMENT
A05	OFFICE MANAGEMENT

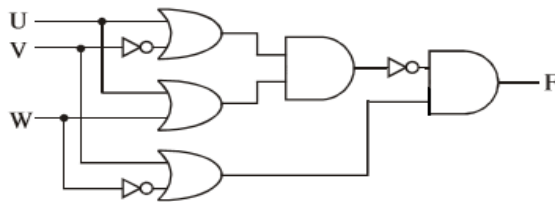
Write Queries for (i) to (iv):

- (i) To display the names of applicants, who are paying fee more than 30000
(ii) To display names and annual fee of all applicants who has taken management course.(monthly fee mentioned in the table)

- (iii) To display the applicant name, course name who registered in the year 2012.
- (iv) To display the C_ID (i.e. course ID) and the no. of applicants registered in the course from the applicants table.

- c Give the outputs of the following queries: 2
- (i) Select name, dateofjoin from applicants where gender='f' and cid='a02';
 - (ii) Select min (dateofjoin) from applicants where gender='m';
 - (iii) Select avg (fee) from applicants where c_id='a01' or c_id='a05';
 - (iv) Select sum (fee), c_id from applicants group by c_id having count (*) =2;

- 6 a Prove that $(A+B) \cdot (A \cdot B)' = 0$ using Boolean laws. 2
- b Write the Boolean Expression for the result of the Logic /circuit as shown in the Figure 2
below:



- c Derive a canonical SOP expression for a Boolean function F represented by the following truth table 1

A	B	C	F
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	1

- d Reduce the following expression to its simplest form using K-Map 3
 $F(P,Q,R,S) = \pi(0,1,2,4,8,9,10,12)$

- 7 a Identify the topologies for the following 1
- (i) All the nodes form a circular path for data to travel and each node is connected to other two nodes.
 - (ii) Devices are connected through control hub and the control hub is responsible for transmitting and receiving data from each to destination.

- b State one advantage and disadvantage of Bus topology over Star topology. 1

- c State the role of DNS. 1

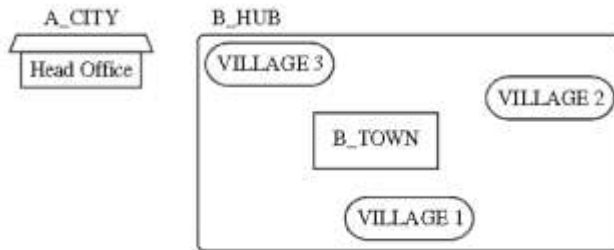
- d Expand the following and state their use. 2

- (i) GPRS
- (ii) CDMA

- e Which type of network (LAN,WAN,PAN) is formed when you connect two mobiles using Bluetooth to transfer a video. 1

- f Digital India Hub is a knowledge and skill community which has an aim to uplift the standard of knowledge and skills in the society. It is planning to setup 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 town 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 B_TOWN	2 KM
VILLAGE 2 to B_TOWN	1.0 KM
VILLAGE 3 to B_TOWN	1.5 KM
VILLAGE 1 to VILLAGE 2	3.5 KM
VILLAGE 1 to VILLAGE 3	4.5 KM
VILLAGE 2 to VILLAGE 3	2.5 KM
A_CITY Head Office to B_HUB	25 KM

Number of Computers installed at various locations are as follows :

B_TOWN	120
VILLAGE 1	15
VILLAGE 2	10
VILLAGE 3	15
A_CITY OFFICE	6

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.

- Suggest the most appropriate location of the SERVER in the B_HUB (out of the 4 locations), to get the best and effective connectivity. Justify your answer 1
- Suggest the best wired medium and draw the cable layout (location to location) to efficiently connect various locations within the B_HUB 1
- Which hardware device will you suggest to connect all the computers within each location of B_HUB ? 1
- Which service/protocol will be most helpful to conduct live interactions of Experts from Head Office and people at all locations of B_HUB ? 1
