

BHARATIYA VIDYA BHAVAN'S V.M.PUBLIC SCHOOL, VADODARA
SAMPLE PAPER

Class : XII
Subject : Computer Science

Max Marks : 70
Time Allotted : 3 hrs

General Instructions :

Programming Language : C++.

All questions are compulsory

Q1. (a) Differentiate between break and continue statements in C++. Explain with an example. [2]

(b). Identify the necessary header files for the following program to execute successfully. [1]

```
# include<conio.h>
# include<iostream.h>
void main( )
{ char str[20];
  gets (str);
  for(int I=0 ; str[I]!='\0' ; I++)
  if(isdigit( str [ I ]))
  str[I]=str[I]-32;
  cout . write( str , 20);
  getch( ); }
```

(c) Rewrite the following program after removing syntax errors . Underline each correction. [2]

```
struct School
{ int school_code=110;
  char school_name[20]; };
void main( )
{ School S1={101,"BHAVANS"};
  showschool(S1);
  cout<<school_code<<school_name; }
void showschool(int X)
{ cout<<X . school_code<<X . school_name;}
```

(d) Find the output of the following code: [2]

```
void main()
{ char *a[2]={"Little" , "Angel"};
  int L;
  for( int i=0;i<2;i++)
  {L=strlen(a[i]);
  for(int j=0 ; j<L; j++ , a[i]++)
  cout<<*a[i]<<".";
  cout<<endl; } }
```

(e) Find the output of the following code: [3]

```
void withdef(int N=30)
{ for(int i=N ; i>=12; i - =7 )
  cout<<i<<"\t";
  cout<<endl; }
void control (int &mynum)
{ mynum + = 8;
  withdef(mynum); }
void main( )
{ int s=16;
  control(s);
```

```
withdef( );
cout<<"Number="<<s<<endl;}
```

(f) Given the following code : [2]

```
# include <iostream.h>
# include<stdlib.h>
void main( )
{ int guess , NEW;
  randomize( );
  cin>>guess;
  for(int i=1;i<=4;i++)
  { NEW=guess-random(i);
    cout<<(char)NEW<<"@";
  } }
```

If the value of guess entered is 100, what is/are the possible outputs of the following options i ,ii ,iii , iv ?

- i. d@c@c@b@
- ii. d@a@b@c@
- iii. d@c@b@d@
- iv. d@a@b@b@

2 (a) Which are the dynamic allocation and de-allocation operators . Explain with examples. [2]

(b) Consider the following class and answer the questions given below:

```
class sample
{ int a;
  char b[20];
  float c;
  public:
  sample( );// to initialize data members
  sample(char b1[20], float c1);//function 1 – to initialize
  sample(sample&o); //function2 } ;
```

- i) Define function 1 & function 2 outside the class. [1]
 - ii) Write the call statement for function 2. [1]
- (c) Define a class **University** with the following specifications [4]

```
Private members
Course_Code   an array of characters sized 10
Course_type   an array of characters of size 10
Duration      int
Fees          float
Assign( )     function to assign "Short Term" to Course type if the duration of course is less than
              or equal to 6 month else it assigns 'Long Term'

Public Members
Getcourse( )  to read course code, duration and fee and assign course type by calling
              function Assign();
```

Dispcourse() Function to call print all the details.

(d) Answer the questions (i) to (iv) based on the following: [4]

```
class Per_Info
{ int roll;
  char name[20];
  protected:
```

```
char add[10];
```

```
public:  
char Class;  
Per_Info();  
void read_Per_details();  
void disp_Per_details();  
};  
class exam : public Per_Info  
{  
    int marks[5];  
    char grade[5];  
public:  
    exam();  
    void read_exam_details();  
    void disp_exam_details();  
};  
class result :protected exam  
{ int tot;  
  char ovrallgrd;  
public:  
  result();  
  void read_res_details();  
  void disp_res_details();  
};
```

- i) Mention the members which are accessible by an object of class result.
- ii) What is the size of an object of class result?
- iii) Name the data members which are accessible from the member functions read_exam_details().
- iv) What is the order of constructor invocation when an object of result is created?

3(a) Write a function in C++ to accept a one dimensional integer array and its size as arguments and convert it to a 2D array such that it is stored in the following pattern [3]

Example: If the elements of the array are: 1 2 3 4 5

Then the 2 D array should be

5 0 0 0 0

4 4 0 0 0

3 3 3 0 0

2 2 2 2 0

1 1 1 1 1

(b) An array A[5][5] is stored in memory . The address of A[2][4] when stored in Row major form is 1556 and when stored in Column major form is 1588. Find the address of A [1][2] in row major.[3]

(c) i) Convert the postfix notation to infix notation

T , F,AND,F,T,OR,NOT,OR [1]

ii) Convert the given expression into postfix notation using stack: [1]

$-A \wedge B - (P / Q * R)$

(d) Write a function in C++ which accepts a 2 D array and its size as arguments and swaps the elements of the main diagonal with the elements of the off diagonal. [2]

Example: If the given 2D array is

1 2 3

Output should be

3 2 1

4 5 6
7 8 9

4 5 6
9 8 7

- (e) Consider the following code which implements a Linked stack for voters. Write the definition of PUSH(), to insert a new node into the stack with the required information, also write POP() to delete a node from the stack. [4]

```
struct voter
{ int vid;
  char name[20];
  voter*link;
};
class stack
{ voter * TOP;
public:
voter() { TOP=NULL;}
void PUSH();
void POP();
};
```

- 4(a). Observe the program code carefully and fill in the blanks marked as statement 1 and statement 2. [1]

```
class Pracfile
{ int Pracno , Timetaken ,marks;
  char PracName[20] ;
public:
void Enterprac (); // A function to enter Pracfile details
void Showprac(); // A function to display details of Pracfile
int Rtime(){return Timetaken ; } // A function to return time taken.
void Assignmarks(int M) { marks=M ; } // A function to assign marks. };
void AllocateMarks( )
{ fstream File;
  File.open("MARKS.DAT" , ios::binary | ios::in | ios::out );
  Pracfile P;
  int Record=0;
  while(File.read( (char*) &P, sizeof(P) ))
  { if(P.Rtime()>50)
    P.Assignmarks(0);
    else
    P.Assignmarks(10);
    _____//statement1
    _____//statement2
    Record++; }
  File.close(); }
```

If the function Allocatemarks() is supposed to allocate marks for the records in the file "MARKS.DAT" based on their value of the member Timetaken. Write C++ statement for statement 1 and statement 2 where statement 1 is required to position the file write pointer to an appropriate place in the file and statement 2 is to perform the write operation with the modified record.

- (b). Write a function in C++ to count and display the number of lines beginning with "The" or "This" present in a text file "ABC.txt". [2]
Example: If the file contains the following text:

This is to test the above Program. The program should count the number of the or this in a text file.
Output should be: Count = 2

(c) Consider the given code and answer the following question: [3]

```
class Mobile
{ char mob_id[20] , mob_name[30];
  float price;
public:
void getmob ( ); // to accept the mobile details
void putmob ( );// to display mobile details
int chkmob(char n[ ])
{ return strcmpi(mob_id,n); }
};
```

Write a function in C++ to update a record with the mob_id "E72" in a file "MOB.DAT" which stores the objects of this class.

5(a) Define Primary Key. Explain with the help of an example. [2]

(b) Consider the following tables GIFT_SHOP , GIFT_PURCHASE and answer questions I and II.

GIFT_SHOP

GCODE	GNAME	CATEGORY	PRICE	QTY
G001	Teddy Bear	Stuffed Toy	300	20
G002	Snake and Ladder	Game	100	30
G003	Panchtantra	Story Book	600	12
G004	Popeye	Stuffed Toy	450	16
G005	Liliput Tales	Story Book	300	13
G006	Chess	Game	450	15

GIFT_PURCHASE

GCODE	DATE_OF_PURCHASE	QTY_PURCHASE
G002	12-DEC-13	25
G004	15-MAR-13	5
G003	31-OCT-12	3

I Write SQL commands for the following: [4]

- To increase the price by Rs. 20 for category 'Game'.
- To display the name and price of gifts having quantity greater than 15 in the descending order of GNAME.
- To insert the following record into the table GIFT_PURCHASE
'G001',5-MAR-13 , 5
- To display the date of purchase and category of 'Popeye' ;

II Write the output of the following SQL commands. [2]

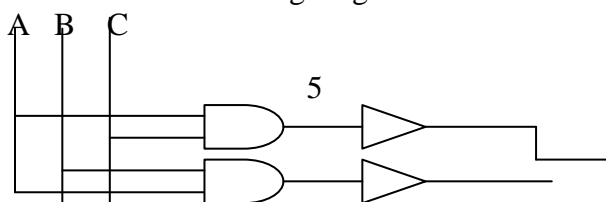
- Select COUNT(DISTINCT CATEGORY) from GIFT_SHOP.
- Select CATEGORY, MAX(QTY) from GIFT_SHOP Group By CATEGORY;
- Select PRICE from GIFT_SHOP where GNAME in ('Teddy Bear' , 'Popeye');
- Select GNAME "GIFT NAME" from GIFT_SHOP where PRICE between 400 and 600.

6(a) State the absorption laws in Boolean algebra. Prove one of them algebraically. [1]

(b) Write SOP form of the given expression . [1]

$$F(a,b,c) = (a + b + c') (a' + b + c') (a' + b' + c) (a' + b' + c')$$

(c) Write the equivalent expression for the following diagram [1]



(d) Simplify using K-Map [3]

$$F(P, Q, R, S) = \Sigma (0, 2, 7, 8, 10, 12, 13, 14, 15)$$

(e) Represent the following using NOR gate [2]

$$F(X, Y, Z) = X + YZ'$$

7(a) Define Gateway. [1]

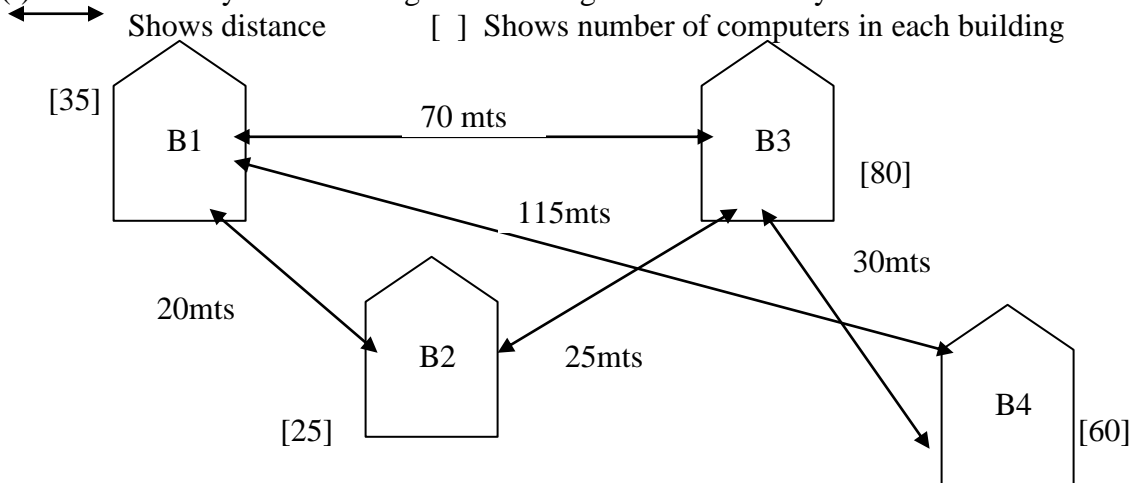
(b) What is a spam? [1]

(c) What is the difference between Freeware and Shareware? [1]

(d) Expand the following: CDMA XML [1]

(e) Name any two security methods and explain any one of them. [2]

(f) M S University has following four buildings in Vadodara city to run different courses



Computers in each building are networked but buildings are not networked so far. The University has now decided to connect buildings also.

(a) Suggest a cable layout for these buildings. [1]

(b) In each of the buildings, the management wants that each LAN segment gets a dedicated bandwidth i.e. bandwidth must not be shared. Which device should be installed to connect computers in each building to achieve this? [1]

(c) The management also wants to make available shared Internet access for each of the buildings. Which device should be installed in each building to accomplish this? [1]

(d) The University wants to link its head office in B1 to Cambridge University in London. [1]

i) Which type of transmission medium is appropriate for such a link?

ii) Which type of network would this connection result into?
