Kendriya Vidyalaya Sangathan
Model Question Paper-4
Class – XII
Subject - Computer Science (083)

Time: 3.00 hrs **Max. Marks: 70**

Blue Print

S.No.	UNIT		VSA (1 Mark)	SA-1 (2 Marks)	SA-II (3 Marks)	LA (4 Marks)	TOTAL
1	**Review of C++ covered in Class XI**		1(1)	8 (4)	3 (1)		**12 (6)**
2	**Object Oriented Programming in C++**						
	a)	Introduction to OOP using C++		2 (1)		4 (1)	**6 (2)**
	b)	Constructor & Destructor		2 (1)			**2 (1)**
	c)	Inheritance				4 (1)	**4 (1)**
3	**Data Structure & Pointers**						
	a)	Address Calculation			3 (1)		**3 (1)**
	b)	Static Allocation of Objects		2 (1)	3 (1)		**5 (2)**
	c)	Dynamic Allocation of Objects				4 (1)	**4 (1)**
	d)	Infix & Postfix Expressions		2 (1)			**2(1)**
4	**Data File Handling in C++**						
	a)	Fundamentals of file Handling	1 (1)				**1 (1)**
	b)	Text File		2 (1)			**2 (1)**
	c)	Binary Files			3 (1)		**3 (1)**
5	**Databases and SQL**						
	a)	Database Concepts		2 (1)			**2 (1)**
	b)	Structured Query Language		2 (1)		4 (1)	**6 (2)**
6	**Boolean Algebra**						
	a)	Introduction to Boolean algebra & Laws		2 (1)			**2 (1)**
	b)	SOP & POS		2 (1)			**2 (1)**
	c)	Karnaugh Map			3 (1)		**3 (1)**
	d)	Basic Logic Gates	1 (1)				**1 (1)**
7	**Communication & Open**						

	Source Concepts						
	a)	Introduction to Networking	1 (1)				**1 (1)**
	b)	Media ,Devices ,Topologies & Protocols				4 (1)	**4 (1)**
	c)	Security		2 (1)			**2 (1)**
	d)	Webservers	2 (1)				**2 (2)**
	e)	Open Source Terminologies	1 (1)				**1 (1)**
Total			**7 (7)**	**28 (14)**	**15 (5)**	**20 (5)**	**70 (32)**

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Model Question Paper-4
Class – XII
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Max. Marks: 70 **Time: 3 Hours**

Note (i) All questions are compulsory. (ii) Programming Language : C++

Q 1 a) What is the benefit of using function prototype? Give a suitable example to illustrate it using a C++code. 2

b) Name the header files that shall be required for successful compilation of the following C++ program: 1

```
main()
        {  char c;
        c=getchar();
        if(isdigit( c))
                cout<<"\n It is a digit";
        if(isalpha( c))
                cout<<"\n It is any alphabet";
        return 0;
        }
```

c) Deepa has just started working as a programmer in STAR SOFTWARE Company. In the company she has got her first assignment to be done using a C++ function to find the smallest number out of a given set of numbers stored in a one-dimensional array. But she has committed some logical mistakes while writing the code and is not getting the desired result. Rewrite the correct code underlining the corrections done. Do not add any additional statements in the corrected code. 2

```
int find(int a[],int n)
{ int s=a[0];
for(int x=1;x<n;x++)
        if(a[x]>s)
        a[x]=s;
return(s);
}
```

d)What will be the output of following code fragment, consider all essential header files are included: 2

```
void main()
{
        char ch='E';
        int value=ch;
        while (--value > 65)
        {ch=value--;
        cout<<++ch<<"=>";
}
}
```

(e) Find the output of the following program: 3

```
#include <iostream.h>
struct School
{
        int year;
        float topper;
};
void change( School *s, int x=10)
{
```

```
        s->topper=(s->topper+25)-x;
        s->year++;
    }
    void main()
    {
        School arr[]={{2008,150},{2009,98}}
        School *pointer=arr;
        change(pointer,100);
        cout<<arr[0].year<<"- "<<arr[0].topper<<endl;
        change(++pointer);
        cout<<pointer->year<<"- "<<pointer->topper<<endl;
    }
```

(f) Observe the following program and find out, which output(s) out of (i) to (iv) will **not** be expected from the program?
What will be the minimum and the maximum value assigned to the variable Chance? 2

```
#include<iostream.h>
#include<stdlib.h>
void main()
{
 randomize();
intArr[]={9,6}, N;
int chance=random(2) +10;
for (int c=0;c<2;c++)
 {
    N=random(2);
cout<<Arr[N] + chance<<"#";
}
}
```

i) 9#6#
ii) 19#17#
iii) 19#16#
iv) 20#16#

Q 2) **(**a) Can two versions of an overloaded function with same signatures have different return types? If yes, why? If no, why not? 2
(b) Answer the questions (i) and (ii) after going through the following class: 2

```
    class Bag
    {
        int pockets;
    public:
        Bag ( )                 // Function 1
        {
            pockets = 30;
            cout<< " The Bag has pockets"<<endl;
        void Company ( )            // Function 2
        {
            cout<< " The company of the Bag is VIP "<<endl;
        }
        Bag (int D)             // Function 3
        {
            pockets = D;
            cout<<" The Bag has pockets"<<endl;
```

```
    }
    ~ Bag ( )                    // Function 4
    {
        cout<<" Thanks!"<<endl;
    }
};
```

(i) In object Oriented Programming, what is function 4 referred as and when does it get invoked / called?

(ii) Which concept is illustrated by Function 1 and function 3 together? Write an example illustrating the call of these functions.

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

Private Members:

- Processor _speed of type int
- Price of type float
- Processor_type of type string

Public Members:

- A constructor to initialize the data members.
- A function cpu_input() to enter value of processor_speed.
- A function void setcostANDtype( ) to check the speed of the processor and set the cost and type depending on the speed:

Processor_speed	Price	Processor_type
>=4000 MHz	Rs 30000	C2D
<4000 &>=2000	Rs 25000	PIV
< 2000	Rs 20000	Celeron

- A function cpu_output() to display values of all the data members.

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

```
class QUALITY
{ private :
        char Material [30];
        float thickness;
protected :
        char manufacturer[20];
 public:
    QUALITY( );
    void READ( );
    void WRITE( );
};
class QTY: public QUALITY
{
        long order;
      protected:
        int stock;
public:
    double *p;
    QTY( );
    void RQTY ( );
    void SQTY( );
```

```
};

  class FABRIC: public QTY
    { private:
    intfcode,fcost;
    public:
        FABRIC( );
       void RFABRIC( );
        void SFABRIC( );
};
```

i) Mention the member names that are accessible by an object of QTY class.
ii) Name the data members which can be accessed by the objects of FABRIC class.
iii) Name the members that can be accessed by the function of FABRIC class.
iv) How many bytes will be occupied by an object of class FABRIC?

Q 3 a) Write a function in C++ to return the element which is present maximum number of times in an array . The function prototype is given below. 2
int MAX(intarr[], int size)
Example: : If the array is 2 4 2 4 2 4 2 4 2 4 2 2 4
then the function will return a value 2

b) An array PP[20][25] is stored in the memory along the row with each of the elements occupying 4 bytes. Find out the memory location for the element ***PP[13][20]***, if the element PP[7][10] is stored at memory location 3454. 3

c)Write a function in C++ to display the sum of all the positive and even numbers, stored in a two dimensional array. The function prototype is as follows: 3
void SumPosEven(int Array[5][5]);

d)Write a function in C++ to perform insert operation on a dynamically allocated Queue. 4

```
struct  Node
    {
    int Code;
    char Description[10];
    Node * link;
    };
```

e) Evaluate the following postfix notation of expression :(Show status of Stack after each operation) 2
True,False,NOT,OR,False,True,OR,AND

Q 4 a) Observe the program segment given below carefully, and answer the question that follows: 1

```
class PracFILE {
        intPracno;
        char PracName[20];
        intTimeTaken;
        int Marks;
public:
        void EnterPrac ( );     // function to enter PracFile details
        void ShowPrac ( );      // function to display PracFile details
        intRTime( )             // function to return TimeTaken
        {return TimeTaken;}

        void Assignmarks (int M)      // function to assign Marks
        { Marks =M: }
};
```

```
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);
_ _ _ _ _ _ _ _ _ //statement 1
_ _ _ _ _ _ _ _ _ //statement 2
Record ++;
}
File.close ( );
}
```

If the function Allocate Marks ( ) 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 the **statement 1** and s**tatement 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 the number of ***small consonants*** present in a text file **ALPHA.TXT.** 2

c) Write a function in C++ to search for a camera from a binary file"CAMERA.DAT" containing the objects of class CAMERA (as defined below). The user should enter the Model No and the function should search and display the details of the camera. 3

```
class CAMERA {
long ModelNo;
float MegaPixel;
int Zoom;
char Details[120];
public:
        void Enter() { cin>>ModelNo>>MegaPixel>>Zoom; gets(Details);}
        void Display() {cout<<ModelNo<<MegaPixel<<Zoom<<Details<<endl;}
```

Q 5 a) Write the difference(s) between ***Union*** &***Cartesian product*** with example. **2**

b) Consider the following tables SCHOOL and ADMIN. Write SQL commands for the statements (1) to (4) **4**

(c) give outputs for SQL queries (5) to (8). **2**

Table: SCHOOL

CODE	TEACHERNAME	SUBJECT	DOJ	PERIODS	EXPERIENCE
1001	RAVI SHANKAR	ENGLISH	12/03/2000	24	10
1009	PRIYA RAI	PHYSICS	03/09/1998	26	12
1203	LISA ANAND	ENGLISH	09/04/2000	27	5
1045	YASHRAJ	MATHS	24/08/2000	24	15
1123	GANAN	PHYSICS	16/07/1999	28	3
1167	HARISH B	CHEMISTRY	19/10/1999	27	5
1215	UMESH	PHYSICS	11/05/1998	22	16

Table: ADMIN

CODE	GENDER	DESIGNATION	BASIC	PERKS
1001	MALE	VICE PRINCIPAL	25000	5000
1009	FEMALE	COORDINATOR	22000	4000
1203	FEMALE	COORDINATOR	20500	3000

1045	MALE	HOD	18000	2000
1123	MALE	SENIOR TEACHER	15000	1000
1167	MALE	SENIOR TEACHER	13500	1000
1215	MALE	HOD	17000	2000

1. To display TEACHERNAME, PERIODS of all teachers whose periods less than 25 and name start with either R or U.
2. Display the names, subject and total salary of all male teachers in sorted order where salary is the sum of Basic and perks.
3. To display TEACHERNAME, CODE and DESIGNATION from tables SCHOOL and ADMIN for female teacher.
4. To display CODE, TEACHERNAME and SUBJECT of all teachers who have joined the school after 01/01/1999.
5. SELECT SUM(SALARY), DESIGNATION FROM ADMIN GROUP BY DESIGNATION;
6. SELECT TEACHERNAME, GENDER FROM SCHOOL, ADMIN

WHERE DESIGNATION = 'COORDINATOR' AND SCHOOL.CODE=ADMIN.CODE

7. SELECT DESIGNATION, COUNT (*) FROM ADMIN

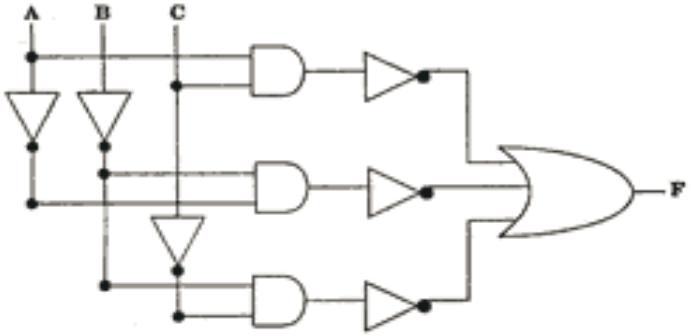
GROUP BY DESIGNATION HAVING COUNT (*) <3;

8. SELECT COUNT (DISTINCT SUBJECT) FROM SCHOOL;

Q 6 a)Verify the following algebraically: **2**

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

b)Write the equivalent Boolean Expression for the following Logic Circuit. **1**



c)Write the equivalent Canonical Sum of Product expression for the following Product of Sum Expression

F(X,Y,Z) = Π (1,3,6,7) **2**

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

F(U,V,W,Z) =Π(0, 1, 2, 5, 8, 10, 11, 13, 14, 15)

Q 7. (a)What is web Portal ? Name any one. 1

b) How is Freeware different from Free Software? 1

c) Which of the following is not a Client Side script: 1

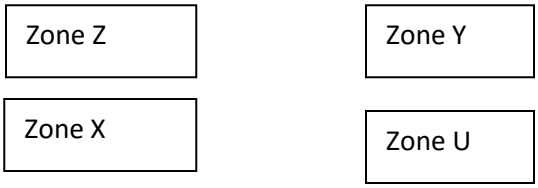
i. VB Script ii. Java Script iii. ASP iv. PHP

d) What is the difference between Trojan Horse and Virus in terms of computers? 2

e)Expand the following terms with respect to Networking: 1

(i) WAIS (ii) GSM

f) The Reliance Info Sys has set up its Branch at Srinagar for its office and web based activities. It has 4 Zone of buildings as shown in the diagram: **4**



Center to center distances various blocks

Zone X to Zone Z	40 m
Zone Z to Zone Y	60 m
Zone Y to Zone X	135 m
Zone Y to Zone U	70 m
Zone X to Zone U	165 m
Zone Z to Zone U	80 m

Number of Computers

Zone X	50
Zone Z	130
Zone Y	40
Zone U	15

A. Suggest a most suitable cable layout of connections between the Zones and topology.

B. Suggest the most suitable place (i.e., Zone) to house the server of this organization with a suitable reason, with justification.

C. Suggest the placement of the following devices with justification:

i) Repeater (ii) Hub / Switch

D. The organization is planning to link its head office situated in Mumbai at the offices at Srinagar. Suggest an economic way to connect it- the company is ready to compromise on the speed of connectivity. Justify your answer.

Kendriya Vidyalaya Sangathan
Model Question Paper - 4
Marking Scheme
Class – XII
Subject - Computer Science (083)

Max. Marks: 70 **Time: 3hrs.**

Q 1(a) A function prototype is a function declaration that specifies the return type and the data type of the arguments.
The main purpose of the function prototyping is to prevent errors caused by data type mismatches between the values passed to a function and the type of value function is expecting. **1 mark**
It enables a compiler to compare each use of function with the prototype to determine whether the function is invoked properly or not. The number and types of arguments can be easily compared and any wrong number or type of the argument is reported.

Eg:: **1 mark**

```
#include<iostream.h>
int sum(int,int);  //function protoype
void main()
  {
inta,b;
cin>>a>>b;
cout<<"Sum="<<sum(a,b);
}
int sum(intx,int y)       //function definition
  {
    return x+y;
}
```

b)
```
#include<iostream.h>
#include<ctype.h>
# include<stdio.h>
```
1/2
1/2

c)
```
int find(int a[], int n)
{ int s=a[0];
  for(int x=1;x<n;x++)
        if(a[x]<s)
        s= a[x];
 return s;
}
```

(d) D=>B=>

(e) 2009-75 1 mark
2010-113 1 mark

(f) (i) ,(ii), (iv) 1 mark
(for any of the above two options specified give 1/2 mark)
Minimum value of chance=10 1/2 mark
Maximum value of chance=11 1/2 mark

Q 2 a) No 1 mark
Functions with same signature, same name but different return types are not allowed in C++. The second declaration is treated as an erroneous re-declaration of the first and is flagged at the compile time as error. 1 mark
Only if the signatures are different then it is allowed.

```
 Float square (float f);          //different signatures, hence
Double square(double d);                //different return types allowed
```

b) a) Destructor 1/2 mark
It is invoked automatically when the object goes out of scope. 1/2 mark

b) Polymorphism or Function Overloading. 1/2 mark

```
Bag b //invokes function 1
Bag ob(32); //invokes function 3
      Or
Bag ob=Bag(32);
```

(1/2 mark if both statements are correct)

c)
```
class Computer {
    private:
        intprocessor_speed;
        float price;
        char p_type[10];
    public:
        Computer() { processor_speed=0;
                     price=0;
                     strcpy(p_type," "); }
        void cpu_input()
            {cin>>processor_speed;}
        void setcostAndtype()
            { if(processor_speed>=4000)
                { price=30000;
                strcpy(p_type, "C2D");
                }
              else if((processor_speed>=2000)&&(processor_speed<4000)
                { price=25000;
                strcpy(p_type, "PIV");
                }
              else if(processor_speed<2000)
                { price=20000;
                strcpy(p_type, "Celeron");
                }
            }
        void cpu_output()
            {
                cout<<"\n Processor_speed::"<<processor_speed;
                cout<<"\n Price::"<<price;
                cout<<"\n Processor Type::"<<p_type;
            }
};
```

(1 mark) (1/2 mark) (2 mark) **½mark**

d) i) *p, RQty(), SQty(), Read(), Write()
ii) *p
iii) *Data members*- fcode, fcost, stock, Manufacturer, *p
Member functions- Read(), Write(),RQty(), SQty(), Rfabric(), Sfabric()
iv) 66 bytes(assuming it is a 16-bit machine -size of double *p is 2 bytes) (**1 mark for each)**

Q 3 a)

```
int find(int a[], int n)
{  int s, max, count[10];
    for(int i=0;i<n;i++)
      {  s=a[i];
         count[i]=0;
         for(int x=0;x<n;x++)
            if(s==a[x])
               count[i]++;
       }
      max=count[0];
     int   max_val=a[0];
      for(i=0;i<n;i++)
       {
        if(max<count[i])
        { max=count[i];
          max_val=a[i];
        }
       }
     return(max_val);
      }
```

1mark

1 mark

Or any other alternative approach

Q 3 (b) FOR ROW-MAJOR

A[I][J]=B + W[N(I-1) + (J-1)]

PP[7][10]=B+4[25*(6) + 9] **½ mark**

3454=B+636

B=2818 **1 mark**

PP[13][20]=2818+4[25*(12) +1 9] **½ mark**

PP[13][20] =4094 **1 mark**

(c) void SumPosEven(intArr[5][5])

```
{       int s=0;
            for(int i=0;i<5;i++)                                  ½ mark
            for(int j=0;j<5;j++)                                  ½ mark
            { if(Arr[i][j]>0)                                     ½ mark
                  { if(Arr[i][j]%2==0)                            ½ mark
                        s=s+Arr[i][j];                            ½ mark

             }
            }
        cout<<"Sum of Positive even numbers="<<s;                 ½ mark

        return;
}
```

(d) void ins_Queue(Node * rear)

```
{
 Node * nptr=new Node;                                  ½mark
 cout<<"\n Enter the value for Code::";
 cin>>nptr-> code;
 cout<<"\n Enter the value for Description::";
 gets(nptr-> description);                  1½mark  for assigning values
 nptr->link=Null;
 if(rear = = Null)
```

```
  front=rear=nptr;                                          1mark
else
  { rear->link=nptr;                                        ½mark
    rear=nptr;                                              ½mark
   }
}
```

(e). The operation is as follows: **2mark**

Elements Scanned	Stack
True	True
False	True, False
NOT	True, True
OR	True
False	True, False
True	True, False, True
OR	True, True
AND	True

Result : True

Q 4 (a) The Statement1 is :

File.seekp((Record – 1)*sizeof(P) OR File.seekp(-sizeof(P) ,ios :: curr);

The satement1 is : File.write(char *)&P, Sizeof (P)); **½ +½mark**

(b)
```
void count_small()
{ ifstream fin("ALPHA.TXT")                                 ½ mark
  char w;
int c=0;
while(!fin.eof())                                           ½ mark
  { fin.get(w);
   if(fin.eof())
     break;
   if(islower(w))                                           ½mark
    { if(w!='a' && w!='e'&& w!='i'&& w!='o'&& w!='u')       ½mark
        c++;
   }
fin.close();
cout<<c;    }
```

(c)
```
void Search() {
CAMERA C;
long modelnum;
cin>>modelnum;                                              ½mark
ifstream fin;
fin.open("CAMERA.DAT",ios :: binary |ios::in);              ½mark
while (fin.read((char *)&C,sizeof (C))){                    1mark
if (C.GetModelNo() == modelnum)                             ½mark
        C.Display();                                        ½mark
}
fin.close();
}
```

Q 5(a) **UNION (U)**

The union of two relations is a relation that includes all the tuples that are either in R or in S or in both R and S. Duplicate tuples are eliminated.

For union, two relations should be **union compatible (ie i) degree of two relations should be same ii) domains of ith attribute of A and ith attribute of B should be same.)**

CARTESIAN PRODUCT(×)

It combines the tuples of one relation with all the tuples of the other relation. It yields a relation which has degree equal to the sum of degrees of the two relations operated upon. The cardinality of new relation is the product of the number of tuples in two relations operated upon.

b) i)
```
Select TeacherName ,Periods
From School
Where Periods <25
And(TeacherName Like "R%" ORTeacherName Like "U%");
```
1mark

(ii)
```
Select TeacherName, Subject, Basic + Perks "Total Salary"
From School, Admin
Where School.Code=Admin.Code And Gender ="MALE";
```
1mark

(iii)
```
Select TeacherName , School.code, Designation
From School ,Admin
Where School.Code=Admin.Code
      And Gender="FEMALE"
Order By TeacherName
```
½mark
½mark

(iv)
```
Select Code,TeacherName,Subject
From School
Where DOJ >'01/01/1999';
```
1**mark**

(C) v)

Sum(Basic)	**Designation**
25000	Vice Principal
42500	Coordinator
35000	HOD
28500	Senior Teacher

½ mark

vi)

TeacherName	**Gender**
PriyaRai	Female
Lisa Anand	Female

½ mark

vii)

Designation	**Count(*)**
Vice Principal	1
Coordinator	2
HOD	2
Senior Teacher	2

½ mark

(viii) **Count (Distinct Subject)** **½mark**

4

Q 6 a) L.H.S=(A' +B').(A+B)

=A'A+A'B+B'A+B'B (Distributive Law) **1mark**

=0+A'B+B'A+0 (A'A=0 COMPLEMENTARITY LAW)

½mark

=A'A+B'A=R H S **½mark**

b) $(\bar{A}\,\bar{C}) + (\bar{A}\,\bar{B}) + (\bar{B}\,\bar{C})$ 1**mark**

(c) F (X,Y,Z) =π(1,3,6,7)

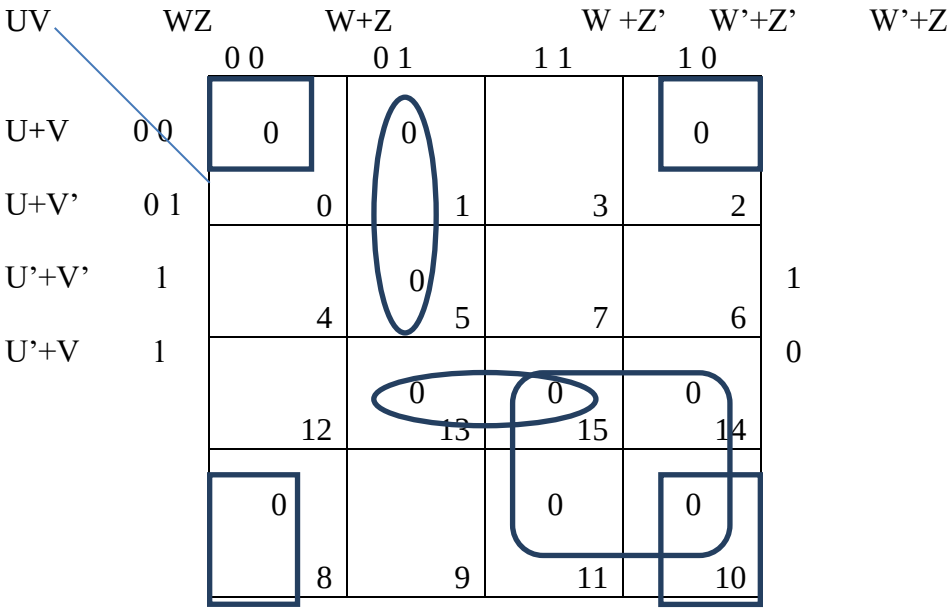
Equivalent SOP expression=∑(0,2,4,5) **½mark**

Equivalent canonical SOP expression will be= $m_0 + m_2 + m_4 + m_5$ **½mark**

Equivalent Sop expression is

$F(X,Y,Z) = \bar{X}\,\bar{Y}\,\bar{Z} + \bar{X}\,Y\,\bar{Z} + X\,\bar{Y}\,\bar{Z} + X\,\bar{Y}\,Z$ **1mark**

(d) $F(U,V,W,Z) = \pi(0,1,2,5,8,10,11,13,14,15)$



(1 ½ mark for correct mapping)

(1 mark for correct identification of Quads and pairs)

$Q_1 = M_0 . M_2 . M_8 . M_{10} = (V+Z)$ $P_1 = M_1 . M_5 = U+W+Z'$

$Q_2 = M_{10} . M_{11} . M_{14} . M_{15} = (U'+W')$ $P2 = M_{13} . M_{15} = U'+V'+Z'$

Final expression=

$(V+Z).(U'+W').(U+W+Z').(U'+V'+Z')$ 1 ½ mark for correct answer.

Q 7 a) Website that serves as a gateway or a main entry point ('cyber door') on the internet to a specific field-of-interest or an industry. A portal provides at least four essential services:

(1) search engine(s)
(2) email
(3) links to other related sites,
(4) personalized content.

It may also provide facilities such as chat, members list, free downloads, etc. Portals such as AOL, MSN, Netcenter, and Yahoo, earn their revenue from membership fees and/or byselling advertising space on their webpages. Also called portal site or web portal. **1 mark**

b) Freeware is software that is distributed without demanding a fee for its usage. It allows copying and further distribution, but not modification and whose **source code is not available**.

Free software is a software that is freely accessible and **can be freely used, changed, improved,** copied and distributed. And no payments are needed to be made for free software. **1 mark**

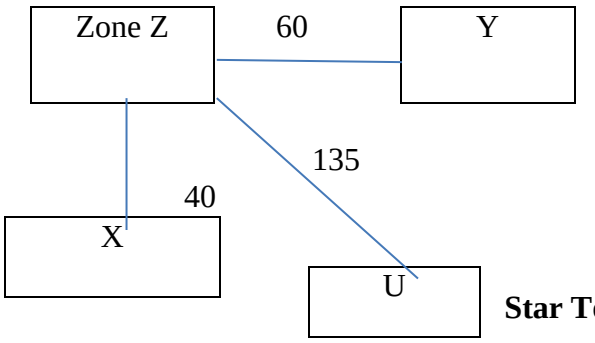
c) ASP and PHP **½ +½mark**

d)A computer virus attaches itself to a program or file enabling it to spread from one computer to another, leaving infections as it travels. A virus is spread by human action, people will unknowingly continue the spread of a computer virus by sharing infecting files or sendingemails with viruses as attachments in the email.

The Trojan Horse, at first glance will appear to be useful software but will actually do damage once installed or run on your computer. Those on the receiving end of a Trojan Horse are usually tricked into opening them because they appear to be receiving legitimate software or files from a legitimate source. When a Trojan is activated on your computer, the results can vary.
Trojans are also known to create a backdoor on your computer that gives malicious users access to your system, possibly allowing confidential or personal information to be compromised. Unlike viruses and worms, **Trojans do not reproduce by infecting other files nor do they self-replicate.**
1+1 marks

e) i) WAIS-Wide area information server
ii) GSM –Global system for mobile communication **½+½mark**

f) (A)



=235 m

Star Topology
½+½mark

(B) Zone Z because it has maximum number of computers thus cabling cost will be reduced and most traffic will be local. **½+½mark**

(C) (1) Repeater –Between Z & U, becausedistance is greater than 75 m **½mark**

(2) Hub/Switch – At all Zones X,V,Y,Z **½mark**

(D) An economic way of connecting is Dial-up or Broadband as it can connect computers at an economic rate though it provides lesser speed than other expensive methods. **½+½mark**