
CBSE Question Paper 2018
Class 12 Computer Science

Time allowed : 3 hours

Maximum Marks : 70

General Instructions :

1. SECTION A refers to programming language C++.
 2. SECTION B refers to programming language Python.
 3. SECTION C is compulsory for all.
 4. Answer either SECTION A or SECTION B.
 5. It is compulsory to mention on the page 1 in the answer book whether you are attempting SECTION A or SECTION B.
 6. All questions are compulsory within each section.
-

SECTION A

[Only for candidates, who opted for C++]

1. a. **Write the type of C++ tokens (keywords and user defined identifiers) from the following : (2)**
 - i. **else**
 - ii. **Long**
 - iii. **4Queue**
 - iv. **_count**

Ans.

- i. keyword
- ii. Identifier
- iii. None
- iv. Identifier

NOTE: Ignore (iii)

- b. **The following C++ code during compilation reports errors as follows :**

Error: 'ofstream' not declared

Error: 'strupr' not declared

Error: 'strcat' not declared

Error: 'FIN' not declared

Write the names of the correct header files, which must be included to compile the code successfully : (1)

```
void main()
{
ofstream FIN("WISH.TXT");
char TEXT2[]="good day";
char TEXT1[]="John!";
strupr(TEXT2);
strcat(TEXT1, TEXT2);
FIN<<TEXT1<<endl;
}
```

Ans.

- i. fstream
- ii. string

- 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 included in the program.

```
Typedef Count int;
void main()
{
Count C;
cout<<"Enter the count:";
cin>>C;
for (K = 1; K<=C; K++)
cout<< C "*" K <<endl;
}
```

Ans. typedef int Count ;//Error 1, Error 2

```
void main()
{
Count C;
int K; //OR Count K; //Error 3
```

```

cout<<"Enter the count:";
cin>>C;
for (K = 1; K<=C; K++)
// OR for ( int K = 1; K<=C; K++) //Error 3
// OR for ( Count K = 1; K<=C; K++) //Error 3
cout<< C << "*" << K <<endl; //Error 4
// OR cout<< C * K <<endl; //Error 4
}

```

- d. Find and write the output of the following C++ program code : (3)

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

Revert(int &Num, int Last=2)

```

{
Last=(Last%2==0)?Last+1:Last-1;
for(int C=1; C<=Last; C++)
Num+=C;
}
void main()
{
int A=20,B=4;
Revert(A,B);
cout<<A<<"&"<<B<<endl;
B--;
Revert(A,B);
cout<<A<<"#"<<B<<endl;
Revert(B);
cout<<A<<"#"<<B<<endl;
}

```

Ans. 35&4

38#3 38#9

- e. Find and write the output of the following C++ program code : (2)

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

#define Modify(N) N*3+10

```

void main()
{
int LIST[ ]={10,15,12,17};
int *P=LIST, C;
for(C=3; C>=0; C--)
LIST[I]=Modify(LIST[I]);
for (C=0; C<=3; C++)
{
cout<<*P<<" ";
P++;
}
}

```

Ans. Considering LIST[I] being replaced with LIST[C]

40:55:46:61:

- f. Look at the following C++ code and find the possible output(s) from the options (i) to (iv) following it. Also, write the highest and lowest values that can be assigned in the array A. (2)

Note :

- Assume all the required header files are already being included in the code.
- The function random(n) generates an integer between 0 and n – 1.

```

void main()
{
randomize();
int A[4], C;
for(C=0; C<4; C++)
A[C]=random(C+1)+10;
for(C=3; C>=0; C--)
cout<<A[C]<<"@";
}

```

(i)	(ii)
13@10@11@10@	15141210

(iii)	(iv)
12@11@13@10@	12@11@10@10@

Ans. (i) and (iv)

A_{Min} = 10

A_{Max} = 13

2. a. **Which function(s) out of the following can be considered as overloaded function(s) in the same program ? Also, write the reason for not considering the other(s) as overloaded function(s). (2)**

void Execute(char A,int B); // Function 1

void Execute(int A,char B); // Function 2

void Execute(int P=10); // Function 3 void

Execute(); // Function 4

int Execute(int A); // Function 5 void

Execute(int &K); // Function 6 Ans.

Option [i]

Functions 1,2,3 are overloaded

Reason: Function 4,5,6 would give ambiguity for Function 3 OR

Any equivalent valid reason

OR

Option [ii]

Functions 1,2,4,5 are overloaded

Reason: Function 3 and 6 not considered in this case because it would give redeclaration error for Function 5

OR Any equivalent valid reason

OR

Option [iii]

Functions 1,2,4,6 are overloaded

Reason: Function 3 and 5 not considered in this case because it would give redeclaration error for Function 6

OR Any equivalent valid reason

b. Observe the following C++ code and answer the questions (i) and (ii).

Note : Assume all necessary files are included.

```
class FIRST
{
int Num1;
public:
void Display() //Member Function 1
{
cout<<Num1<<endl;
}
};
class SECOND: public FIRST
{
int Num2;
public:
void Display() //Member Function 2
{
cout<<Num2<<endl;
}
};
void main()
{
SECOND S;
_____ //Statement 1
_____ //Statement 2
}
```

i. Which Object Oriented Programming feature is illustrated by the definitions of classes FIRST and SECOND ? (1)

Ans. Inheritance

OR

Encapsulation

OR

Data Abstraction

OR

Data Hiding

- ii. **Write Statement 1 and Statement 2 to execute Member Function 1 and Member Function 2 respectively using the object S. (1)**

Ans. S.FIRST::Display() //Statement 1

S.Display() //Statement 2

OR

S.SECOND::Display() //Statement 2

- c. **Write the definition of a class CONTAINER in C++ with the following description : (4)**

Private Members

- Radius, Height // float
- Type // int (1 for Cone,2 for Cylinder)
- Volume // float
- CalVolume() // Member function to calculate
// volume as per the Type

Type	Formula to Calculate Volume
1	$3.14 * \text{Radius} * \text{Height}$
2	$3.14 * \text{Radius} * \text{Height} / 3$

Public Members

- GetValues() // A function to allow user to enter value //
of Radius, Height and Type. Also, call
// function CalVolume() from it
- ShowAll() // A function to display Radius, Height,
// Type and Volume of Container

Ans. class CONTAINER

{

```

float Radius, Height;
int Type;
float Volume;
void CalVolume();
public:
void GetValues();
void ShowAll();
};
void CONTAINER::GetValues()
{
cin>>Radius>>Height>>Type ;
CalVolume();
} void CONTAINER::ShowAll()
{
cout<<Radius<<Height<<Type<<Volume<<endl;
}

```

<pre> void CONTAINER::CalVolume() { if (Type == 1) Volume=3.14*Radius*Height; else if (Type == 2) Volume=3.14*Radius*Height/3; } </pre>	<pre> void CONTAINER::CalVolume() { switch (Type) { case 1: Volume =3.14*Radius*Height; break; case 2: Volume=3.14*Radius*Height/3; } } </pre>
---	--

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

```

class Teacher
{
int TCode;
protected: char
Name[20];

```

```

public:
Teacher();
void Enter(); void Show();
};
class Course
{
int ID;
protected:
Char Title[30];
public:
Course();
void Initiate();
void Display();
};
class Schedule : public Course, private Teacher {

int DD,MM,YYYY;
public:
Schedule();
void Start();
void View();
};
void main()
{
Schedule S;
}

```

- i. Which type of Inheritance out of the following is illustrated in the above example?

Single Level Inheritance, Multilevel Inheritance, Multiple Inheritance Ans.

Multiple Inheritance

- ii. Write the names of all the members, which are directly accessible by the member function View() of class Schedule.

Ans. Start(), DD, MM, YYYY

Display(), Initiate(), Title

Enter(), Show(), Name

View() // Optional

- iii. **Write the names of all the members, which are directly accessible by the object S of class Schedule declared in the main() function.**

Ans. View(), Start()

Display(), Initiate()

- iv. **What will be the order of execution of the constructors, when the object S of class Schedule is declared inside the main() function ?**

Ans. Course(), Teacher(), Schedule()

3. a. **Write the definition of a function SumEO(int VALUES[], int N) in C++, which should display the sum of even values and sum of odd values of the array separately. (2)**

Example : If the array VALUES contains

20	20	22	21	53
----	----	----	----	----

Then the functions should display the output as :

Sum of even values = 42 (i.e., 20+22)

Sum of odd values = 99 (i.e., 25+21+53)

Ans. void SumEO(int VALUES[], int N)

```
{
int SE = 0, SO = 0;
for (int l=0;l<N;l++)
{
if(VALUES[l] %2 == 0)
SE += VALUES[l];
else
SO += VALUES[l];
}
cout<< "Sum of even values = " << SE<<endl;
cout<< "Sum of odd values = " << SO<<endl;
}
```

OR

Any other correct alternative code in C++

- b. Write a definition for a function `UpperHalf(int Mat[4][4])` in C++, which displays the elements in the same way as per the example shown below. (3)

For example, if the content of the array `Mat` is as follows :

25	24	23	22
20	19	18	17
15	14	13	12
10	9	8	7

The function should display the content in the following format :

25 24 23 22

20 19 18

15 14

10

Ans. `void UpperHalf(int Mat[4][4])`

```
{
for (int l=0;l<4;l++)
{
for (int J=0;J<4-l;J++)
cout<<MAT[l][J]<< " ";
cout<<endl;
}
}
```

OR

`void UpperHalf(int Mat[4][4])`

```
{
for (int l=0;l<4;l++)
{
for (int J=0;J<4;J++)
if ((l+J)<=3)
cout<<MAT[l][J]<< " " ;
}
```

```
cout<<endl;
}
}
```

OR

Any other correct alternative code in C++

- c. Let us assume $\text{Data}[20][15]$ is a two-dimensional array, which is stored in the memory along the row with each of its elements occupying 2 bytes. Find the address of the element $\text{Data}[10][5]$, if the element $\text{Data}[15][10]$ is stored at the memory location 15000. (3)

Ans. $\text{LOC}(\text{Data}[10][5]) = \text{LOC}(\text{Data}[15][10]) + 2(15 \cdot (10 - 15) + (5 - 10))$
 $= 15000 + 2((-75) + (-5))$
 $= 15000 + 2(-80)$
 $= 15000 - 160$
 $= 14840$

OR

$\text{LOC}(\text{Data}[I][J]) = \text{Base}(\text{Data}) + W \cdot (\text{NC} \cdot (I - \text{LBR}) + (J - \text{LBC}))$

Taking $\text{LBR}=0$, $\text{LBC}=0$

$\text{LOC}(\text{Data}[15][10]) = \text{Base}(\text{Data}) + 2 \cdot (15 \cdot 15 + 10)$

$15000 = \text{Base}(\text{Data}) + 2 \cdot (15 \cdot 15 + 10)$

$\text{Base}(\text{Data}) = 15000 - 2 \cdot (235)$

$\text{Base}(\text{Data}) = 15000 - 470$

$\text{Base}(\text{Data}) = 14530$

$\text{LOC}(\text{Data}[10][5]) = 14530 + 2 \cdot (10 \cdot 15 + 5)$

$= 14530 + 2 \cdot (155)$

$= 14530 + 310$

$= 14840$

OR

$\text{LOC}(\text{Data}[I][J]) = \text{Base}(\text{Data}) + W \cdot (\text{NC} \cdot (I - \text{LBR}) + (J - \text{LBC}))$

Taking $\text{LBR}=1$, $\text{LBC}=1$

$$\text{LOC}(\text{Data}[15][10]) = \text{Base}(\text{Data}) + 2 * (15 * 14 + 9)$$

$$15000 = \text{Base}(\text{Data}) + 2 * (15 * 14 + 9)$$

$$\text{Base}(\text{Data}) = 15000 - 2 * (219)$$

$$\text{Base}(\text{Data}) = 15000 - 438$$

$$\text{Base}(\text{Data}) = 14562$$

$$\text{LOC}(\text{Data}[10][5]) = 14562 + 2 * (15 * 9 + 4)$$

$$= 14562 + 2 * (139)$$

$$= 14562 + 278$$

$$= 14840$$

- d. Write the definition of a member function `AddPacket()` for a class `QUEUE` in C++, to remove/delete a `Packet` from a dynamically allocated `QUEUE` of `Packets` considering the following code is already written as a part of the program. (4) `struct Packet`

```
{
int PID;
char Address[20];
Packet *LINK;
};
class QUEUE
{
Packet *Front, *Rear; public:
QUEUE(){Front=NULL;Rear=NULL;}
void AddPacket();

void DeletePacket();
~QUEUE();
};
```

Ans. void QUEUE::AddPacket()

```
{
if(Front != NULL)
{
Packet *T;
T=Front;
```

```

cout<<Front->PID<<Front->Address<<" removed"<<endl;
//OR cout<<T->PID<<T->Address<<" removed"<<endl;
Front = Front->LINK;
delete T;
if (Front==NULL)
Rear=NULL;
}
else
cout<< "Queue Empty"<<endl;
}

```

OR

Any other equivalent code in C++

- e. **Convert the following Infix expression to its equivalent Postfix expression, showing the stack contents for each step of conversion : (2)**

$U * V + (W - Z) / X$

Ans. $((U * V) + ((W - Z) / X))$

INFIX	STACK	POSFIX
U		U
*	*	U
V	*	UV
)		UV*
+	+	UV*
W		UV*W
-	+ -	UV*W
Z	+ -	UV*WZ
)	+	UV*WZ-
/	+/	UV*WZ-
X	+/	UV*WZ-X

)	+		UV*WZ-X/
)			UV*WZ-X/+

OR

$$U * V + (W - Z) / X$$

INFIX	STACK	POSFIX
U		U
*	*	U
V	*	UV
+	+	UV*
(+(UV*
W	+(UV*W
-	+(-	UV*W
Z	+(-	UV*WZ
)	+	UV*WZ-
/	+/	UV*WZ-
X	+/	UV*WZ-X
		UV*WZ-X/+

4. a. A text file named MATTER.TXT contains some text, which needs to be displayed such that every next character is separated by a symbol '#'.
Write a function definition for HashDisplay() in C++ that would display the entire content of the file MATTER.TXT in the desired format. (3)

Example :

If the file MATTER.TXT has the following content stored in it :

THE WORLD IS ROUND

The function HashDisplay() should display the following content :

T#H#E# #W#O#R#L#D# #I#S# #R#O#U#N#D#

Ans. void HashDisplay()

```
{  
char ch;  
ifstream F("MATTER.TXT" );
```

```
    ifstream F;  
    F.open ("MATTER.TXT" );  
    OR  
    fstream F;  
    F.open ("MATTER.TXT", ios::in);  
    OR  
    fstream F ("MATTER.TXT", ios::in);
```

```
while(F.get(ch))  
cout<<ch<<'#';  
F.close(); //IGNORE  
}
```

OR

Any other correct function definition

- b. **Write a definition for a function TotalTeachers() in C++ to read each object of a binary file SCHOOLS.DAT, find the total number of teachers, whose data is stored in the file and display the same. Assume that the file SCHOOLS.DAT is created with the help of objects of class SCHOOLS, which is defined below: (2) class SCHOOLS**

```
{  
int SCode; //School Code  
char SName[20]; //School Name  
int NOT; //Number of Teachers in the school  
public:  
void Display()  
{cout<<SCode<<"#"<<SName<<"#"<<NOT<<endl;}  
int RNOT(){return NOT;}  
};
```



```

Ans. void TotalTeachers()
{
ifstream F;
F.open("SCHOOLS.DAT",ios::binary);
int Count=0;
SCHOOLS S;
while(F.read((char*)&S,sizeof(S)))
Count += S.RNOT();
cout<<"Total number of teachers :"<<Count<<endl;
F.close(); //IGNORE
}

```

OR

```

void TotalTeachers()
{
ifstream F;
F.open("SCHOOLS.DAT",ios::binary);
SCHOOLS S;
while(F.read((char*)&S,sizeof(S)))
cout<<S.RNOT()<<endl;//OR S.Display();
F.close(); //IGNORE
}

```

OR

Any other correct function definition

- c. **Find the output of the following C++ code considering that the binary file SCHOOLS.DAT exists on the hard disk with the following records of 10 schools of the class SCHOOLS as declared in the previous question (4 b). (1)**

SCode	SName	NOT
1001	Brains School	100
1003	Child Life School	115

1002	Care Share School	300
1006	Educate for Life School	50
1005	Guru Shishya Sadan	195
1004	Holy Education School	140
1010	Play School	95
1008	Innovate Excel School	300
1011	Premier Education School	200
1012	Uplifted Minds School	100

```

void main()
{
fstream SFIN;
SFIN.open("SCHOOLS.DAT",ios::binary | ios::in);
SCHOOLS S;
SFIN.seekg(5*sizeof(S));
SFIN.read((char*)&S, sizeof(S));
S.Display();
cout<<"Record : "<<SFIN.tellg()/sizeof(S) + 1<<endl;
SFIN.close();
}

```

Ans. 1004#Holy Education School#140

Record :7

SECTION B

[Only for candidates, who opted for Python]

1. a. **Differentiate between Syntax Error and Run-Time Error. Also, write a suitable example in Python to illustrate both. (2)**

Ans. Syntax error :An error of language resulting from code that does not conform to the syntax of the programming language.

Example

a = 0

while a < 10 # : is missing as per syntax

```
a = a + 1
```

```
print a
```

Runtime error :A runtime error is an error that causes abnormal termination of program during running time..

Example

```
A=10
```

```
B= int(raw_input("Value:"))
```

```
print A/B
```

```
# If B entered by user is 0, it will be run-time error
```

b. **Name the Python Library modules which need to be imported to invoke the following functions : (1)**

i. **sin()**

ii. **search()**

Ans.

i. math

ii. re

c. **Rewrite the following code in Python after removing all syntax error(s).**

Underline each correction done in the code. (2)

```
Val = int(rawinput("Value:"))
```

```
Adder = 0
```

```
for C in range(1,Val,3)
```

```
Adder+=C
```

```
if C%2=0:
```

```
Print C*10
```

```
Else: print
```

```
C* print
```

```
Adder
```

```
Ans. Val = int(raw_input("Value:")) # Error 1
```

```
Adder = 0
```

```
for C in range(1,Val,3) : # Error 2
```

```
Adder+=C
```

```
if C%2==0: # Error 3
```

```
print C*10 # Error 4
```

```
else: # Error 5
print C # Error 6
print Adder
```

OR

Corrections mentioned as follows:

raw_input in place of rawinput

: to be placed in for ==

in place of = print in

place of Print else in

place of Else

C* is invalid, replaced by a suitable integer or C

d. Find and write the output of the following Python code : (2)

```
Data = ["P",20,"R",10,"S",30]
Times = 0
Alpha = " "
Add = 0
for C in range(1,6,2):
Times = Times + C
Alpha = Alpha + Data[C-1]+"$"
Add = Add + Data[C]
print Times, Add, Alpha
```

Ans. 1 20 P430PR960PRS

e. Find and write the output of the following Python code : (3)

```
class GRAPH:
def __init__(self,A=50,B=100):
self.P1=A
self.P2=B
def Up(self,B): self.P2
= self.P2 - B def
Down(self,B): self.P2
= self.P2 + 2*B def
Left(self,A):
```

```

self.P1 = self.P1 - A
def Right(self,A):
self.P1 = self.P1 + 2*A
def Target(self):
print ("",self.P1.":"",self.P2,"")
G1=GRAPH(200,150)
G2=GRAPH()
G3=GRAPH(100)
G1.Left(10)
G2.Up(25)
G3.Down(75)
G1.Up(30)
G3.Right(15)
G1.Target()
G2.Target()
G3.Target()

```

Ans. (190 : 120)

(50 : 75)

(130 : 250)

- f. What possible output(s) are expected to be displayed on screen at the time of execution of the program from the following code ? Also specify the maximum values that can be assigned to each of the variables BEGIN and LAST. (2) import random

```

POINTS=[20,40,10,30,15];
POINTS=[30,50,20,40,45];
BEGIN=random.randint(1,3)
LAST=random.randint(2,4) for C
in range(BEGIN,LAST+1): print
POINTS[C],"#",

```

(i) 20#50#30#	(ii) 20#40#45#
(iii) 50#20#40#	(iv) 30#50#20

Ans. (ii) 20#40#45# and (iii) 50#20#40#

Max value for BEGIN 3

Max value for LAST 4

2. a. **What is the advantage of super() function in inheritance ? Illustrate the same with the help of an example in Python. (2)**

Ans. In Python, super() function is used to call the methods of base class which have been extended in derived class.

```
class person(object):
def __init__(self,name,age):
self.name=name
self.age=age
def display(self):
print self,name, self.Age
class student(person):
def __init__(self,name,age,rollno,marks):
super(student,self).__init__(self, name, age)
self.rollno=rollno self.marks=marks
```

```
def getRoll(self):
print self.rollno, self.marks
```

- b. **class Vehicle: #Line 1 (2)**
Type = 'Car' #Line 2
def __init__(self, name): #Line 3
self.Name = name #Line 4
def Show(self): #Line 5
print self.Name,Vehicle.Type #Line 6
V1=Vehicle("BMW") #Line 7 V1.Show()
#Line 8 Vehicle.Type="Bus" #Line 9
V2=Vehicle("VOLVO") #Line 10
V2.Show() #Line 11

- i. **What is the difference between the variable in Line 2 and Line 4 in the above Python code ?**

Ans. The variable in Line 2 is a class attribute. This belongs to the class itself.

These attributes will be shared by all the instances.

The variable in Line 4 is an instance attribute. Each instance creates a separate copy of these variables.

ii. **Write the output of the above Python code.**

Ans. BMW Car

VOLVO Bus

c. **Define a class CONTAINER in Python with the following specifications : (4)**

Instance Attributes

- **Radius,Height # Radius and Height of Container**

- **Type # Type of Container**

- **Volume # Volume of Container**

Methods

- **CalVolume() # To calculate volume**

as per the Type of container

With the formula as given below :

Type	Formula to Calculate Volume
1	$3.14 * \text{Radius} * \text{Height}$
3	$3.14 * \text{Radius} * \text{Height}/3$

- **GetValue() # To allow user to enter values of**

Radius, Height and Type.

Also, this method should call

CalVolume() to calculate Volume

- **ShowContainer() # To display Radius, Height, Type**

Volume of the Container

Ans. class CONTAINER: # class CONTAINER():/class CONTAINER(Object):

def __init__(self): # def __init__(self,R,H,T,V):

self.Radius=0 # self.Radius=R self.Height=0 #

self.Height=H

self.Type =0 # self.Type=T

self.Volume=0 # self.Volume=V

def CalVolume(self):

if self.Type == 1:

self.Volume = 3.14 * self.Radius * self.Height

```
elif self.Type ==3:
self.Volume = 3.14 * self.Radius * self.Height /3
def GetValue(self):
self.Radius = input("Enter Radius")
self.Height = input("Enter Height")
self.Type = input("Enter type")
self.CalVolume() # OR CalVolume(self)
def ShowContainer(self):
print self.Radius
print self.Height
print self.Type
print self.Volume
```

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

Class Top1(object):

```
def __init__(self,tx): #Line 1
self.X=tx #Line 2
def ChangeX(self,tx):
self.X=self.X+tx
def ShowX(self):
print self.X
```

Class Top2(object):

```
def __init__(self,ty): #Line 3
self.Y=ty #Line 4
def ChangeY(self,ty):
self.Y=self.Y+ty
def ShowY(self):
print self.Y,
```

class Bottom(Top1,Top2): def

```
__init__(self,tz): #Line 5
self.Z=tz #Line 6
Top2.__init__(self,2*tz): #Line 7
```

Top1.__init__(self,3*tz): #Line 8

def ChangeZ(self,tz):

self.Z=self.Z+tz

self.ChangeY(2*tz)

self.ChangeX(3*tz)

def ShowZ(self):

print self.Z,

self.ShowY()

self.ShowX()

B=Bottom(1)

B.ChangeZ(2)

B.ShowZ()

- i. **Write the type of the inheritance illustrated in the above.**

Ans. Multiple Inheritance

- ii. **Find and write the output of the above code.**

Ans. 3 6 9

OR

“Error” / “No Output”

- iii. **What are the methods shown in Line 1, Line 3 and Line 5 known as ?**

Ans. Constructors

- iv. **What is the difference between the statements shown in Line 6 and Line 7 ?**

Ans. Initializing the member of child class in Line 6 and calling the parent class constructor in Line 7

3. a. **Consider the following randomly ordered numbers stored in a list : (3)**

786, 234, 526, 132, 345, 467

Show the content of the list after the First, Second and Third pass of the bubble sort method used for arranging in ascending order ?

Note : Show the status of all the elements after each pass very clearly underlining the changes.

Ans.

I Pass	234	526	132	345	467	786

II Pass	234	<u>132</u>	<u>345</u>	<u>467</u>	<u>526</u>	786
III Pass	<u>132</u>	<u>234</u>	<u>345</u>	467	526	786

- b. **Write the definition of a method ZeroEnding(SCORES) to add all those values in the list of SCORES, which are ending with zero (0) and display the sum. (3)**

For example :

If the SCORES contain [200, 456, 300, 100, 234, 678]

The sum should be displayed as 600

Ans. def ZeroEnding(SCORES):

s=0

for i in

SCORES: if

i%10==0: s=s+i

print s

- c. **Write AddClient(Client) and DeleteClient(Client) methods in Python to add a new Client and delete a Client from a List of Client Names, considering them to act as insert and delete operations of the queue data structure. (4)**

Ans. def AddClient(Client):

C=raw_input("Client name: ")

Client.append(C)

def DeleteClient(Client):

if (Client==[]):

print "Queue empty"

else:

print Client[0], "Deleted"

del Client[0] # OR Client.pop(0)

OR

class queue:

Client=[]

def AddClient(self):

a=raw_input("Client name: ")

queue.Client.append(a)

def DeleteClient(self):

```

if (queue.Client==[]):
print "Queue empty"
else:
print queue.Client[0],"Deleted"
del queue.Client[0]

```

d. Write a definition of a method COUNTNOW(PLACES) to find and display those place names, in which there are more than 5 characters. (2)

For example :

If the list PLACES contains

```
["DELHI","LONDON","PARIS","NEW YORK","DUBAI"]
```

The following should get displayed :

LONDON

NEW YORK

Ans. def COUNTNOW(PLACES):

for P in PLACES:

if len(P)>5:

print P

e. Evaluate the following Postfix notation of expression : (2)

22,11,/5,10*,+,12,-

Ans.

Elements	Stack Contents
22	22
11	22, 11
/	2
5	2, 5
10	2, 5, 10
*	2, 50
+	52
12	52, 12

OR

Any other way of stepwise evaluation

4. a. **Write a statement in Python to open a text file STORY.TXT so that new contents can be added at the end of it. (1)**

Ans. file= open("STORY.TXT","a") OR file.open("STORY.TXT","a")

- b. **Write a method in Python to read lines from a text file INDIA.TXT, to find and display the occurrence of the word "India". (2)**

For example :

If the content of the file is

"India is the fastest growing economy.

India is looking for more investments around the globe.

The whole world is looking at India as a great market.

Most of the Indians can foresee the heights that India is capable of reaching."

The output should be 4.

Ans. def display1(): c=0

file=open('INDIA.TXT','r')

c=0

for LINE in file:

Words = LINE.split()

for W in Words:

if W=="India":

c=c+1

print c

file.close()

OR

def display():

c=0

```
file=open('INDIA.TXT','r')
lines = file.read() # lines = file.readline()
while lines:
words = lines.split()
for w in words:
if w=="India":
c=c+1
lines = file.read() # lines = file.readline()
print c
file.close()
```

- c. **Considering the following definition of class MULTIPLEX, write a method in Python to search and display all the contents in a pickled file CINEMA.DAT, where MTYPE is matching with the value 'Comedy'. (3)**

```
class MULTIPLEX :
def __init__(self,mno,mname,mtype):
self.MNO = mno
self.MNAME = mname
self.MTYPE = mtype
def Show(self):
print self.MNO:"*",self.MNAME,"$",self.MTYPE
```

Ans. def Search(): file=open('CINEMA.DAT','rb')

```
try:
while True:
M=pickle.load(file)
if M.MTYPE=="Comedy":
M.Show()
except EOFError:
pass file.close()
```

SECTION C

[For all the candidates]

5. a. Observe the following tables VIDEO and MEMBER carefully and write the name of the RDBMS operation out of (i) SELECTION (ii) PROJECTION (iii) UNION (iv) CARTESIAN PRODUCT, which has been used to produce the output as shown below. Also, find the Degree and Cardinality of the final result. (2)

TABLE : VIDEO

VNO	VNAME	TYPE
F101	The Last Battle	Fiction
C101	Angles and Devils	comedy
A102	Daredevils	Adventure

TABLE : MEMBER

VNO	MNAME
M101	Namish Gupta
M102	Sana Sheikh
M103	Lara James

TABLE : FINAL RESULT

VNO	VNAME	TYPE	MNO	MNAME
F101	The Last Battle Fiction	Fiction	M101	Namish Gupta
F101	The Last Battle Fiction	Fiction	M102	Sana Sheikh
F101	The Last Battle Fiction	Fiction	M103	Lara James
C101	Angels and Devils	Comedy	M101	Namish Gupta
C101	Angels and Devils	Comedy	M102	Sana Sheikh
C101	Angels and Devils	Comedy	M103	Lara James
A102	Daredevils	Adventure	M101	Namish Gupta
A102	Daredevils	Adventure	M102	Sana Sheikh
A102	Daredevils	Adventure	M103	Lara James

Ans. CARTESIAN PRODUCT

OR Option (iv)

DEGREE = 5

CARDINALITY = 9

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

TABLE : ACCOUNT

ANO	ANAME	ADDRESS
101	Nirja Singh	Bangalore
102	Rohan Gupta	Chennai
103	Ali Reza	Hyderabad
104	Rishabh jain	Chennai
105	Simran Kaur	Chandigarh

TABLE : TRANSACT

TRNO	ANO	AMOUNT	TYPE	DOT
T001	101	2500	Withdraw	2017-12-21
T002	103	3000	Deposit	2017-06-01
T003	102	2000	Withdraw	2017-05-12
T004	103	1000	Deposit	2017-10-22
T005	101	12000	Deposit	2017-11-06

- i. To display details of all transactions of TYPE Deposit from Table TRANSACT.

Ans. SELECT * FROM TRANSACT WHERE TYPE = 'Deposit ';

- ii. To display the ANO and AMOUNT of all Deposits and Withdrawals done in the month of October 2017 from table TRANSACT.

Ans. SELECT ANO,AMOUNT FROM TRANSACT
WHERE DOT >= '2017-10-01' AND DOT <= '2017-10-31' ;

OR

SELECT ANO,AMOUNT FROM TRANSACT
WHERE DOT BETWEEN '2017-10-01' AND '2017-10-31' ;

- iii. **To display the last date of transaction (DOT) from the table TRANSACT for the Accounts having ANO as 103.**

Ans. SELECT MAX(DOT) FROM TRANSACT WHERE ANO = 103;

- iv. **To display all ANO, ANAME and DOT of those persons from tables ACCOUNT and TRANSACT who have done transactions less than or equal to 3000.**

Ans. SELECT ACCOUNT.ANO, ANAME, DOT FROM ACCOUNT, TRANSACT WHERE ACCOUNT.ANO=TRANSACT.ANO AND AMOUNT <=3000;

OR

SELECT A.ANO, ANAME, DOT FROM ACCOUNT A, TRANSACT T WHERE A.ANO=T.ANO AND AMOUNT <=3000;

- v. **SELECT ANO, ANAME FROM ACCOUNT WHERE ADDRESS NOT IN ('CHENNAI', 'BANGALORE');**

Ans.

ANO	ANAME
103	Ali Reza
105	Simran Kaur

OR

ANO	ANAME
101	Nirja Singh
102	Rohan Gupta
103	Ali Reza
104	Rishabh Jain
105	Simran Kaur

- vi. **SELECT DISTINCT ANO FROM TRANSACT;**

Ans. DISTINCT ANO

101

102

103

vii. **SELECT ANO, COUNT(*), MIN(AMOUNT) FROM TRANSACT
GROUP BY ANO HAVING COUNT(*) > 1;**

Ans.

ANO	COUNT (*)	MIN (AMOUNT)
101	2	2500
103	2	1000

viii. **SELECT COUNT(*), SUM(AMOUNT) FROM TRANSACT
WHERE DOT <= '2017-06-01';**

Ans.

COUNT (*)	SUM (AMOUNT)
2	5000

6. a. **State any one Absorption Law of Boolean Algebra and verify it using truth table.**

(2)

Ans. $X + X \cdot Y =$

X Verification:

X	Y	X.Y	X+X.Y
0	0	0	0
0	1	0	0
1	0	0	1
1	1	1	1

OR

$X \cdot (X + Y) = X$

Verification:

X	Y	X.Y	X. (X+Y)
0	0	0	0
0	1	0	0

1	0	1	1
1	1	1	1

OR

$$X + X' \cdot Y = X + Y$$

Verification:

X	Y	X'	X'.Y'	X+X'. Y	X+Y
0	0	1	0	0	0
0	1	1	1	1	1
1	0	0	0	1	1
1	1	0	0	1	1

OR

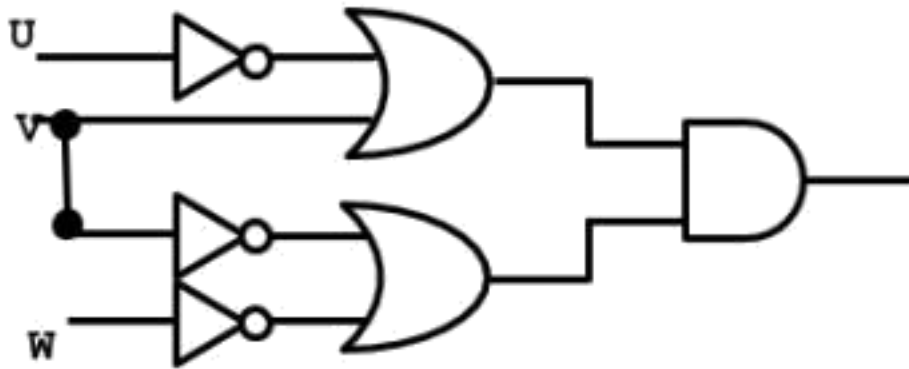
$$X \cdot (X' + Y) = X \cdot Y$$

Verification:

X	Y	X'	X' + Y'	X. (X' + Y')	X.Y
0	0	1	1	0	0
0	1	1	1	0	0
1	0	0	0	0	0
1	1	0	1	1	1

- b. Draw the Logic Circuit of the following Boolean Expression : (2) $(U' + V).(V' + W')$

Ans.



c. Derive a Canonical POS expression for a Boolean function FN, represented by the following truth table : (1)

X	Y	Z	FN (X, Y ,Z)
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

Ans. $FN(X,Y,Z) = (X+Y'+Z).(X+Y'+Z').(X'+Y+Z').(X'+Y'+Z)$

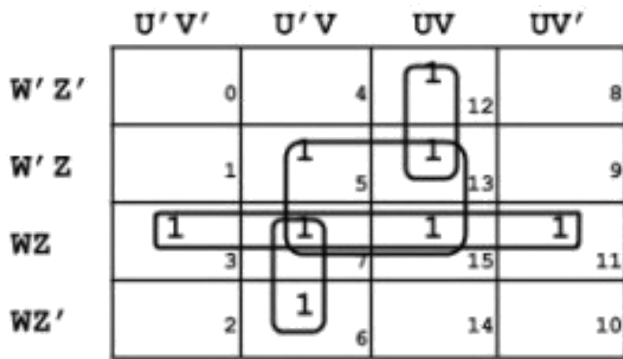
OR

$FN(X,Y,Z) = \prod (2,3,5,6)$

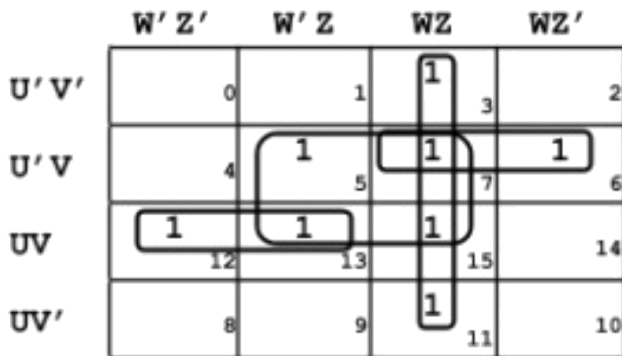
d. Reduce the following Boolean Expression to its simplest form using K-Map : 3

$$G(U,V,W,Z) = \sum(3,5,6,7,11,12,13,15)$$

Ans.



OR



$$F(U, V, W, Z) = VZ + WZ + UVW' + U'VW$$

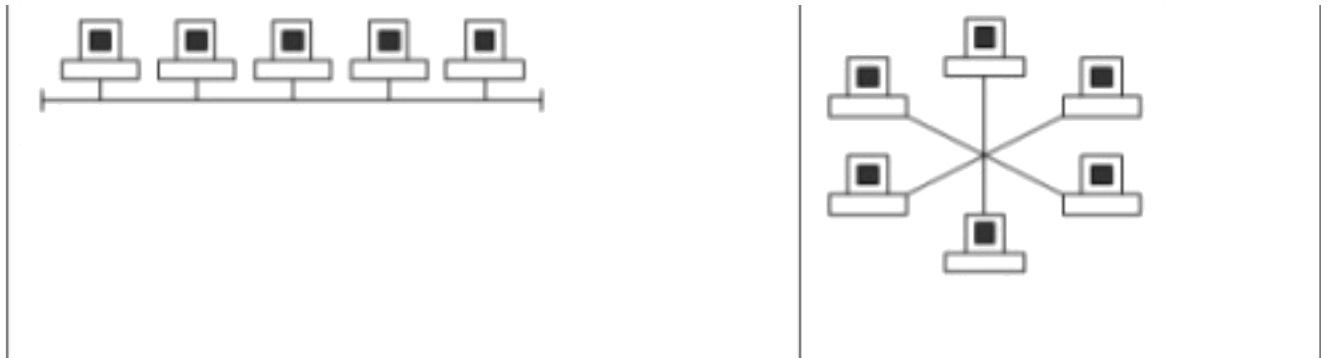
7. a. Differentiate between Bus Topology and Star Topology of Networks. What are the advantages and disadvantages of Star Topology over Bus Topology ? (2)

Ans.

Bus Topology	Star Topology
It is characterised by common transmission medium shared by all the connected nodes.	It is characterised by central switching node connected directly to each of multiple nodes in the network.

OR

Bus Topology	Star Topology



Advantages of Star Topology over Bus Topology

- Faster communication as compared to Bus topology
- Independent line of connection allows freedom of removing or adding nodes from the network

Disadvantages of Star Topology over Bus Topology

- Expensive as compared to Bus topology
- Long cable length

b. **Classify each of the following Web Scripting as Client Side Scripting and Server Side Scripting : (2)**

- i. **Java Scripting**
- ii. **ASP**
- iii. **VB Scripting**
- iv. **JSP**

Ans.

- i. Client Side Scripting / Server Side Scripting
- ii. Server Side Scripting
- iii. Client Side Scripting
- iv. Server Side Scripting

c. **Write the expanded names for the following abbreviated terms used in Networking and Communications : (2)**

- i. **SMTP**
- ii. **VoIP**
- iii. **GSM**
- iv. **WLL**

Ans.

- i. Simple Mail Transfer Protocol

- ii. Voice over Internet Protocol (Voice over IP)
- iii. Global System for Mobile Communication
- iv. Wireless Local Loop

d. CASE STUDY BASED QUESTION :

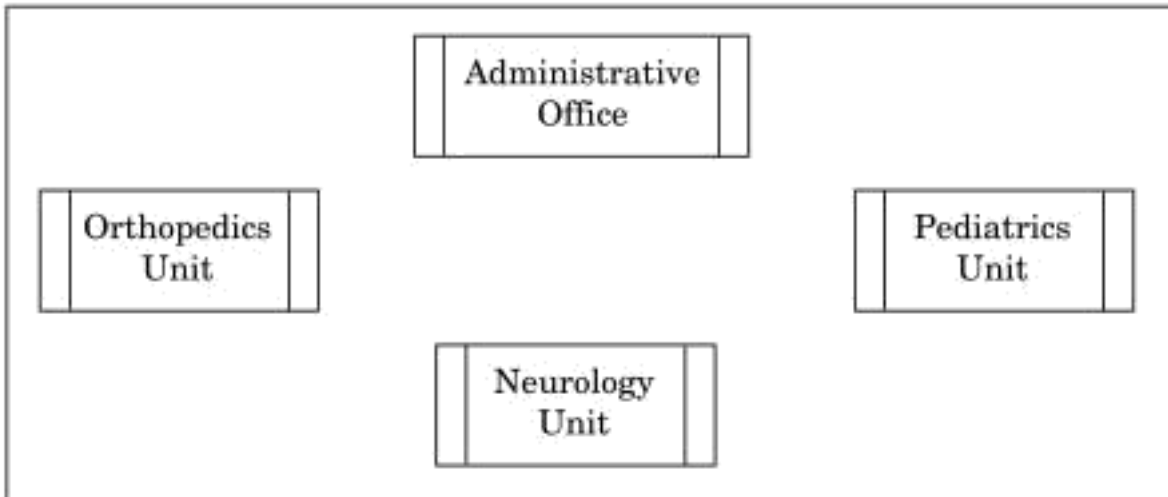
Ayurveda Training Educational Institute is setting up its centre in Hyderabad with four specialised departments for Orthopedics, Neurology and Pediatrics along with an administrative office in separate buildings. The physical distances between these department buildings and the number of computers to be installed in these departments and administrative office are given as follows. You, as a network expert, have to answer the queries as raised by them in (i) to (iv).

Shortest distances between various locations in metres :

Administrative Office to Orthopedics Unit	55
Neurology Unit to Administrative Office	30
Orthopedics Unit to Neurology Unit	70
Pediatrics Unit to Neurology Unit	50
Pediatrics Unit to Administrative Office	40
Pediatrics Unit to Orthopedics Unit	110

Number of Computers installed at various locations are as follows :

Pediatrics Unit	40
Administrative Office	140
Neurology	50
Orthopedics Unit	80

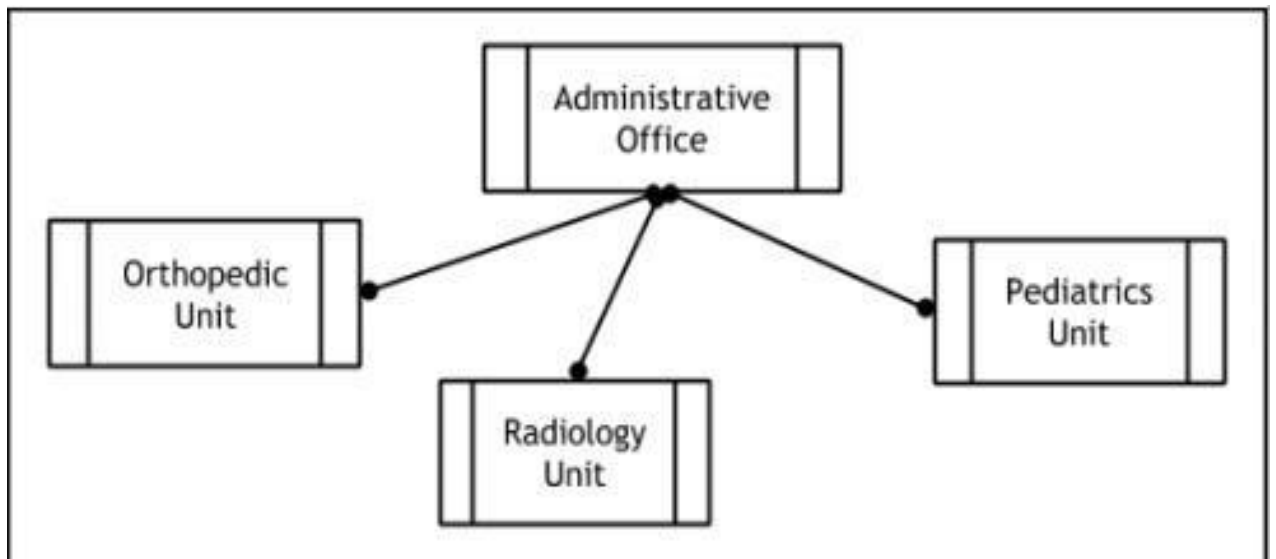


i. Suggest the most suitable location to install the main server of this institution to get efficient connectivity. (1)

Ans. Administrative Office

ii. Suggest the best cable layout for effective network connectivity of the building having server with all the other buildings. (1)

Ans.



OR

Administrative Office is connected to Orthopedic, Radiology, Pediatrics units directly in a Star Topology

iii. Suggest the devices to be installed in each of these buildings for connecting computers installed within the building out of the following : (1)

- Gateway

- **Modem**

- **Switch**

Ans. Switch

- iv. **Suggest the topology of the network and network cable for efficiently connecting each computer installed in each of the buildings out of the following : (1)**

Topologies : Bus Topology, Star Topology

Network Cable : Single Pair Telephone Cable, Coaxial Cable, Ethernet Cable.

Ans. Topology : Star Topology

Network Cable: Ethernet Cable / Coaxial Cable