

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

For Practical Examination Only

Session: Nov-Dec 2021 Examination

Name of Examination: B.tech, Regular Semester: 3rd Date: 05./04/2022

Subject Code: B022(022) Subject Name: DSA Laboratory

Name of Student: V.Om Sai Nageshwar Sharma

Roll No. of Student: 303302220020 Enroll No: BJ4599

Name of the Institution:SSIPMT, Raipur Institute Code: 033

Name of Experiment Allotted: Q1) Describe directed graph along with its weight and adjacency matrix.

..... Q2.) Write a program in C/C++ to implement binary tree using linked list.



Signature of Student



CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY

Bhilai, Durg, Chhattisgarh

Admit Card for Session Nov-Dec 2021



STUDENT DETAILS

Registration No.	BUTSP	Roll No.	30330220029
College Name	D33- SHRI SHANKARACHARYA INSTITUTE OF PROFESSIONAL MANAGEMENT & TECHNOLOGY RAIPUR		
Student's Name	VOM SAI NAGESHWAR SHARMA		
Gender	Male	Date of Birth	17-02-2001
Father's Name	V Someshwar Sharma	Current Semester	3 SEMESTER
Program	B Tech Computer Science Engineering	Course	B.Tech

SUBJECT DETAILS

Sl	Semester	Subject Type	Subject Code	Subject Name	Exam Session	Exam Type	To Appear	Date & Time of Exam
1	3 SEMESTER	Sessional	B000306(046)	Personality Development	Nov-Dec 2021	Regular	Y	23/08/22 10:00 am
2	3 SEMESTER	Theory	B000311(022)	Data structure & Algorithms	Nov-Dec 2021	Regular	Y	21/08/22 10:00 am
3	3 SEMESTER	Theory	B000312(014)	Mathematics - III	Nov-Dec 2021	Regular	Y	25/08/22 10:00 am
4	3 SEMESTER	Theory	B000313(022)	Principles of Programming Languages	Nov-Dec 2021	Regular	Y	28/08/22 10:00 am
5	3 SEMESTER	Theory	B000314(002)	Digital Electronics Logic Design	Nov-Dec 2021	Regular	Y	28/08/22 10:00 am
6	3 SEMESTER	Theory	B000315(022)	Operating Systems	Nov-Dec 2021	Regular	Y	30/08/22 10:00 am
7	3 SEMESTER	Practical	B000321(022)	Data structure & Algorithms Laboratory	Nov-Dec 2021	Regular	Y	05/09/22 10:00 am
8	3 SEMESTER	Practical	B000322(022)	Digital Electronics Logic Design Laboratory	Nov-Dec 2021	Regular	Y	01/09/22 10:00 am
9	3 SEMESTER	Practical	B000323(022)	Operating Systems Laboratory (UNIX)	Nov-Dec 2021	Regular	Y	04/09/22 10:00 am
10	3 SEMESTER	Practical	B000324(022)	Software Laboratory (Sci Lab/MATLAB)	Nov-Dec 2021	Regular	Y	04/09/22 10:00 am

Signature of the Candidate (after receiving)

Signature of the Principal

Signature of COE

INSTRUCTION FOR WRITTEN EXAMINATION

- Candidates suffering from any diseases which would render their presence in the Examination Hall undesirable in the interests of other candidates will not be allowed to enter the Examination Hall. In exceptional cases the Centre Superintendent may permit a candidate to examine in a special arrangement.
- The doors of the Examination Hall will be opened half an hour before the examination starts on the first day and 15 minutes before on other days. Candidates are required to sit in their allotted seats 15 minutes before the examination starts. Candidates entering after the start of examination will not be admitted unless specially permitted by the Centre Superintendent. The candidate will not be allowed to consult any book or paper other than the Examination Hall or out-side.
- Candidates should bring their own pens and Mathematical instruments. Candidates should not be in possession of printed manuscripts (Other than their Admit Card), books and other materials while in the Examination Hall. Material consultation in the Examination Hall, bringing in Electronic equipment and other printed manuscripts from outside is forbidden. Candidates are not allowed to consult any book or paper other than the Examination Hall or out-side.
- Candidates are not allowed to leave the hall until an hour after an examination starts. They should not leave their seats until they have submitted their answer books to an invigilator. Answer books should not be left behind on the desks. It is the duty of the candidate to see that his answer paper is received by the invigilator. No candidate will be allowed to re-enter the Examination Hall after once getting his answer paper. In case of urgent need however candidate may be permitted by the senior invigilator to leave the hall temporarily and not more than once in an hour, upon suggestion. The period of temporary absence should not exceed 3 minutes.
- Candidates are not permitted to talk to each other in the Examination Hall. No one should speak to any other person in any manner.
- Candidates should write their Roll No. and Date on the cover page of their answer book. Candidates are forbidden to write their roll number and Date No. of their college in the answer book while answering the questions. Giving a false Roll No. is serious offence and no answer book without the candidate's Roll Number clearly written on the cover page will be considered.
- Candidates should not write in the examination hall anything on the question paper or bring papers not allowed to take out of the hall any page or more than one page of the question paper. They should not write on the question paper for the examination results throughout the duration of the examination.
- If a candidate is found with any paper not connected with the examination, he will be considered as a candidate for the examination.

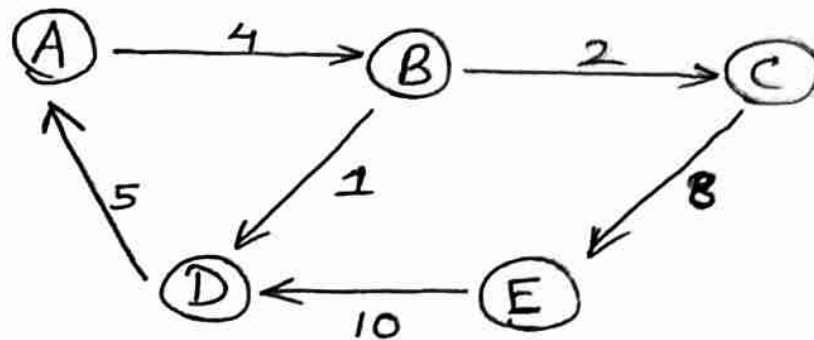
Answer 1: Weighted Directed graph

A weighted directed graph (also known as directed graphs with weights assigned to their arrows, similarly to weighted graphs (which are also known as undirected networks).

A weighted directed graph with the added feature of each edge having a value or a weight. This weight value allows for more complex problems to be expressed through graphs.

An Adjacency Matrix: It is a 2-D array of size V time V , where V is the no. of vertices in a graph. For example, if w is an array (M), $M[i, j] = 1$ indicates there is an edge from vertex i to vertex j . An adjacency matrix for an undirected graph is always symmetric. An adjacency matrix can also be used to represent weighted graphs. For example, if $M(i, j) = w$, then there is an edge from vertex i to vertex j with weight w .

Example :



Weighted Directed Graph

The Adjacency matrix for the above graph is

$$\begin{matrix} & \begin{matrix} A & B & C & D & E \end{matrix} \\ \begin{matrix} A \\ B \\ C \\ D \\ E \end{matrix} & \begin{bmatrix} 0 & 4 & 0 & 0 & 0 \\ 0 & 0 & 2 & 1 & 0 \\ 0 & 0 & 0 & 0 & 8 \\ 5 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 10 & 0 \end{bmatrix} \end{matrix}$$

Answer 2: C program to implement
Binary Tree using linked list.

```
#include <stdio.h>
#include <malloc.h>
```

```
struct node {
    struct node * left;
    char data;
    struct node * right;
};
```

```
struct node * constructTree (int);
void inorder (struct node *);
```

```
char array[] = { 'A', 'B', 'C', 'D', 'E', 'F', 'G',
                  '\0', '\0', 'H' };
```

```
int leftcount[] = { 1, 3, 5, -1, 9, -1, -1, -1,
                    -1, -1, -1 };
```

```
int rightcount[] = { 2, 4, 6, -1, -1, -1, -1, -1,
                     -1, -1 };
```

```
Void main() {
```

```
    struct node *root;
```

```
    root = constructTree(0);
```

```
    printf("In-order Traversal: \n");
```

```
    inorder(root);
```

```
}
```

```
struct node* constructTree (int index) {
```

```
    struct node *temp = Null;
```

```
    if (index != -1) {
```

```
        temp = (struct node *) malloc (sizeof  
            (struct node));
```

```
        temp → left = constructTree (leftcount  
            [index]);
```

```
        temp → data = array [index];
```

```
        temp → right = constructTree (rightcount  
            [index]);
```

```
    }
```

```
    return temp;
```

```
}
```

```
void inorder (struct node* root) {
```

```
    if (root != Null) {
```

```
        inorder (root → left);
```

```
        printf ("%c\t", root → data);
```

```
        inorder (root → right);
```

```
    }
```

```
}
```

Output:

In-order Traversal:

D B H E A F C G.

