**Output(Different spanning tree corresponding to same graph):**

**i.** Enter the name of nodes:-

a b c d e

Enter the name of the node having the token:-

a

Enter the graph

0 1 1 1 1

1 0 1 1 1

1 1 0 1 1

1 1 1 0 1

1 1 1 1 0

The spanning tree is:-

b - a

c - a

d - a

e - a

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : The queue is empty.

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

c Wants to enter the critical section

b Wants to enter the critical section

The lists of the nodes in the queue are:

e Wants to enter the critical section

a : d Wants to enter the critical section

c b e

b : b

c : c

d : d

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

c has the token

The lists of the nodes in the queue are:

a : b e d

b : b

c : c

d : d

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : a

local variable of d : null

local variable of e : null

Process c is entering Critical Section

Process c is coming out of Critical Section

Process a has the token.

The lists of the nodes in the queue are:

a : b e d

b : b

c : The queue is empty.

d : d

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

b has the token

The lists of the nodes in the queue are:

a : e d

b : b

c : The queue is empty.

d : d

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : a

local variable of c : null

local variable of d : null

local variable of e : null

Process b is entering Critical Section

Process b is coming out of Critical Section

Process a has the token.

The lists of the nodes in the queue are:

a : e d

b : The queue is empty.

c : The queue is empty.

d : d

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

e has the token

The lists of the nodes in the queue are:

a : d

b : The queue is empty.

c : The queue is empty.

d : d

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : a

Process e is entering Critical Section

Process e is coming out of Critical Section

Process a has the token.

The lists of the nodes in the queue are:

a : d

b : The queue is empty.

c : The queue is empty.

d : d

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

d has the token

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : The queue is empty.

d : d

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

Process d is entering Critical Section

Process d is coming out of Critical Section

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : The queue is empty.

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : The queue is empty.

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : The queue is empty.

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

**ii.** Enter the name of nodes:-

a b c d e

Enter the name of the node having the token:-

b

Enter the graph

0 1 1 1 1

1 0 1 1 1

1 1 0 1 1

1 1 1 0 1

1 1 1 1 0

The spanning tree is:-

a - b

c - b

d - b

e - b

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : The queue is empty.

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

c Wants to enter the critical section

The lists of the nodes in the queue are:

a Wants to enter the critical section

a : a

d Wants to enter the critical section

b : c a e Wants to enter the critical section

d

c : c

d : d

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

c has the token

The lists of the nodes in the queue are:

a : a

b : a d e

c : c

d : d

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : b

local variable of d : null

local variable of e : null

Process c is entering Critical Section

Process c is coming out of Critical Section

Process b has the token.

The lists of the nodes in the queue are:

a : a

b : a d e

c : The queue is empty.

d : d

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

a has the token

The lists of the nodes in the queue are:

a : a

b : d e

c : The queue is empty.

d : d

e : e

The lists of the local variables are are:

local variable of a : b

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

Process a is entering Critical Section

Process a is coming out of Critical Section

Process b has the token.

The lists of the nodes in the queue are:

a : The queue is empty.

b : d e

c : The queue is empty.

d : d

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

d has the token

The lists of the nodes in the queue are:

a : The queue is empty.

b : e

c : The queue is empty.

d : d

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : b

local variable of e : null

Process d is entering Critical Section

Process d is coming out of Critical Section

Process b has the token.

The lists of the nodes in the queue are:

a : The queue is empty.

b : e

c : The queue is empty.

d : The queue is empty.

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

e has the token

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : The queue is empty.

d : The queue is empty.

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

Process e is entering Critical Section

Process e is coming out of Critical Section

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : The queue is empty.

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : The queue is empty.

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : The queue is empty.

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

**iii.** Enter the name of nodes:-

a b c d e

Enter the name of the node having the token:-

c

Enter the graph

0 1 1 1 1

1 0 1 1 1

1 1 0 1 1

1 1 1 0 1

1 1 1 1 0

The spanning tree is:-

a - c

b - c

d - c

e - c

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : The queue is empty.

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

a Wants to enter the critical section

The lists of the nodes in the queue are:

d Wants to enter the critical section

a : e Wants to enter the critical section

b Wants to enter the critical section

a

b : b

c : a d e b

d : d

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

a has the token

The lists of the nodes in the queue are:

a : a

b : b

c : d e b

d : d

e : e

The lists of the local variables are are:

local variable of a : c

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

Process a is entering Critical Section

Process a is coming out of Critical Section

Process c has the token.

The lists of the nodes in the queue are:

a : The queue is empty.

b : b

c : d e b

d : d

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

d has the token

The lists of the nodes in the queue are:

a : The queue is empty.

b : b

c : e b

d : d

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : c

local variable of e : null

Process d is entering Critical Section

Process d is coming out of Critical Section

Process c has the token.

The lists of the nodes in the queue are:

a : The queue is empty.

b : b

c : e b

d : The queue is empty.

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

e has the token

The lists of the nodes in the queue are:

a : The queue is empty.

b : b

c : b

d : The queue is empty.

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : c

Process e is entering Critical Section

Process e is coming out of Critical Section

Process c has the token.

The lists of the nodes in the queue are:

a : The queue is empty.

b : b

c : b

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

b has the token

The lists of the nodes in the queue are:

a : The queue is empty.

b : b

c : The queue is empty.

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

Process b is entering Critical Section

Process b is coming out of Critical Section

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : The queue is empty.

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : The queue is empty.

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : The queue is empty.

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

**iv.** Enter the name of nodes:-

a b c d e

Enter the name of the node having the token:-

d

Enter the graph

0 1 1 1 1

1 0 1 1 1

1 1 0 1 1

1 1 1 0 1

1 1 1 1 0

The spanning tree is:-

a - d

b - d

c - d

e - d

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : The queue is empty.

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

c Wants to enter the critical section

b Wants to enter the critical section

The lists of the nodes in the queue are:

a : The queue is empty.

b : a Wants to enter the critical section

b

c : c

d : c b a

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

c has the token

The lists of the nodes in the queue are:

a : a

b : b

c : e Wants to enter the critical section

c

d : b a e

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : d

local variable of d : null

local variable of e : null

Process c is entering Critical Section

Process c is coming out of Critical Section

Process d has the token.

The lists of the nodes in the queue are:

a : a

b : b

c : d

d : b a e

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

b has the token

The lists of the nodes in the queue are:

a : a

b : b

c : d

d : a e

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : d

local variable of c : null

local variable of d : null

local variable of e : null

Process b is entering Critical Section

Process b is coming out of Critical Section

Process d has the token.

The lists of the nodes in the queue are:

a : a

b : The queue is empty.

c : d

d : a e

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

a has the token

The lists of the nodes in the queue are:

a : a

b : The queue is empty.

c : d

d : e

e : e

The lists of the local variables are are:

local variable of a : d

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

Process a is entering Critical Section

Process a is coming out of Critical Section

Process d has the token.

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : d

d : e

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

e has the token

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : d

d : The queue is empty.

e : e

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

Process e is entering Critical Section

Process e is coming out of Critical Section

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : d

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : d

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

**v.** Enter the name of nodes:-

a b c d e

Enter the name of the node having the token:-

e

Enter the graph

0 1 1 1 1

1 0 1 1 1

1 1 0 1 1

1 1 1 0 1

1 1 1 1 0

The spanning tree is:-

a - e

b - e

c - e

d - e

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : The queue is empty.

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

b Wants to enter the critical section

The lists of the nodes in the queue are:

a : The queue is empty.

b : d Wants to enter the critical section

b

c : The queue is empty.

d : d

e : b d c Wants to enter the critical section

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

a Wants to enter the critical section

local variable of d : null

local variable of e : null

b has the token

The lists of the nodes in the queue are:

a : a

b : b

c : c

d : d

e : d c a

The lists of the local variables are are:

local variable of a : null

local variable of b : e

local variable of c : null

local variable of d : null

local variable of e : null

Process b is entering Critical Section

Process b is coming out of Critical Section

Process e has the token.

The lists of the nodes in the queue are:

a : a

b : The queue is empty.

c : c

d : d

e : d c a

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

d has the token

The lists of the nodes in the queue are:

a : a

b : The queue is empty.

c : c

d : d

e : c a

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : e

local variable of e : null

Process d is entering Critical Section

Process d is coming out of Critical Section

Process e has the token.

The lists of the nodes in the queue are:

a : a

b : The queue is empty.

c : c

d : The queue is empty.

e : c a

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

c has the token

The lists of the nodes in the queue are:

a : a

b : The queue is empty.

c : c

d : The queue is empty.

e : a

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : e

local variable of d : null

local variable of e : null

Process c is entering Critical Section

Process c is coming out of Critical Section

Process e has the token.

The lists of the nodes in the queue are:

a : a

b : The queue is empty.

c : The queue is empty.

d : The queue is empty.

e : a

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

a has the token

The lists of the nodes in the queue are:

a : a

b : The queue is empty.

c : The queue is empty.

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

Process a is entering Critical Section

Process a is coming out of Critical Section

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : The queue is empty.

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : The queue is empty.

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null

The lists of the nodes in the queue are:

a : The queue is empty.

b : The queue is empty.

c : The queue is empty.

d : The queue is empty.

e : The queue is empty.

The lists of the local variables are are:

local variable of a : null

local variable of b : null

local variable of c : null

local variable of d : null

local variable of e : null