Q: 5 processes P0 through P4;

3 resource types: A(10 instances), B(5instances), C (7 instances)

Snapshot at time T0:

Allocation Max Available

A B C A B C A B C

P0 0 1 0 7 5 3 3 3 2

P1 2 0 0 3 2 2

P2 3 0 2 9 0 2

P3 2 1 1 2 2 2

P4 0 0 2 4 3 3

# Ans: Need

A B C

P0 7 4 3

P1 1 2 2

P2 6 0 0

P3 0 1 1

P4 4 3 1

A= Available or Work; AL= Allocation

A=3 3 2

P1=1 2 2

A= 2 1 0

No need can be satisfied return all resources consumed by P1.

A= 3 3 2

A=A+AL = 3 3 2 + 2 0 0= 5 3 2

p3=0 1 1

A= 5 2 1

No need can be satisfied return all resources consumed by P3.

A=A+AL = 5 3 2 + 2 1 1= 7 4 3

P4=4 3 1

A= 3 1 2

No need can be satisfied return all resources consumed by P4.

A=7 4 3 + 0 0 2= 7 4 5

P0=7 4 3

A= 0 0 2

No need can be satisfied return all resources consumed by P0.

A= 7 4 5 + 0 1 0= 7 5 5

P2=6 0 0

A= 1 5 5

Return all resources consumed by P2.

A= 7 5 5 + 3 0 2= 10 5 7

Now total available resource is 10 5 7.

The system is in a safe state since the sequence < P1, P3, P4, P0, P2> satisfies safety criteria.

***P*1 Request (1,0,2)**

Request ≤ Available (that is, (1,0,2) ≤ (3,3,2) ⇒ true

Allocation Need Available

A B C A B C A B C

P0 0 1 0 7 4 3 2 3 0

P1 3 0 2 0 2 0

P2 3 0 2 6 0 0

P3 2 1 1 0 1 1

P4 0 0 2 4 3 1

A=2 3 0

P1=0 2 0

A= 2 1 0

No need can be satisfied return all resources consumed by P1.

A=2 3 0

A=A+AL = 2 3 0 + 3 0 2 =5 3 2

P3=0 1 1

A= 5 2 1

No need can be satisfied return all resources consumed by P3.

A=5 3 2

A=A+AL = 5 3 2 + 2 1 1 =7 4 3

P4=4 3 1

A= 3 1 2

No need can be satisfied return all resources consumed by P4.

A=7 4 3

A=A+AL = 7 4 3+ 0 0 2 =7 4 5

P0=7 4 3

A= 0 0 2

No need can be satisfied return all resources consumed by P0.

A=7 4 5

A=A+AL = 7 4 5+ 0 1 0 =7 5 5

P2=6 0 0

A= 1 5 5

Return all resources consumed by P2.

A=A+AL = 7 5 5 + 3 0 2 = 10 5 7

Executing safety algorithm shows that sequence < P1, P3, P4, P0, P2> satisfies