

Name :- Darshan Sanjay Jadhav

class :- BE.IT

Roll No :- 23

Subject :- I.S. LAB

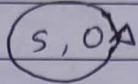
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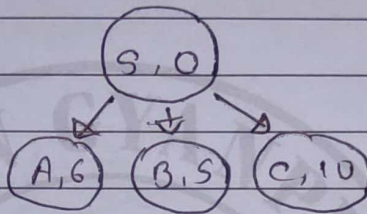
Q.	1
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1.1)

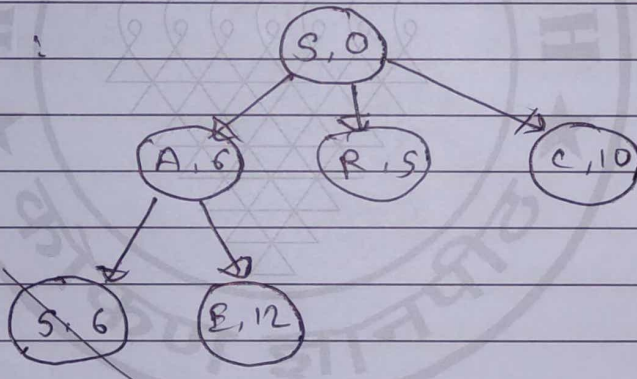
Step 0:



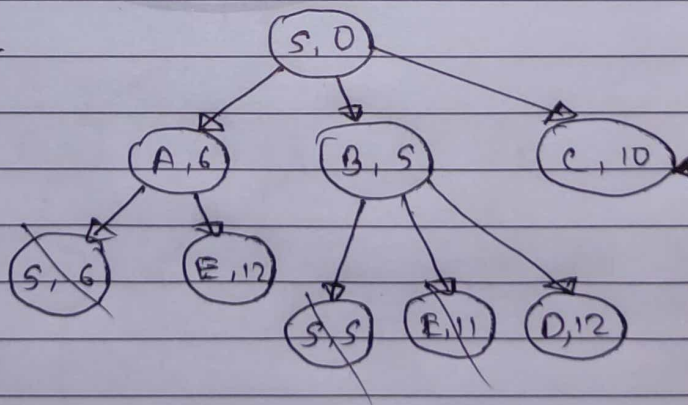
Step 1!



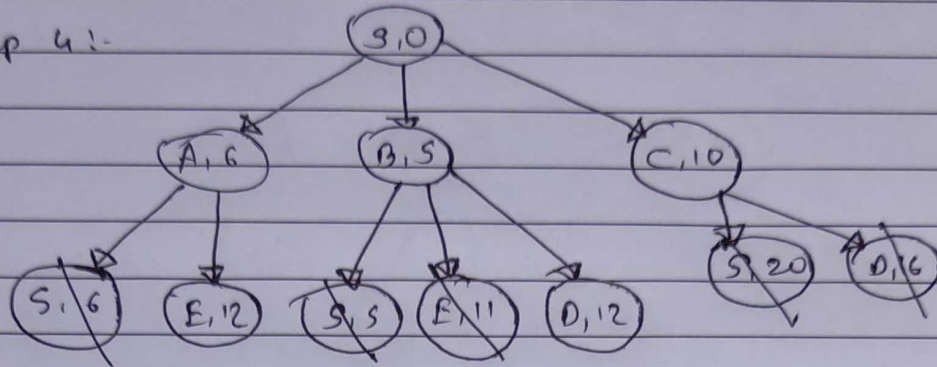
Step 2



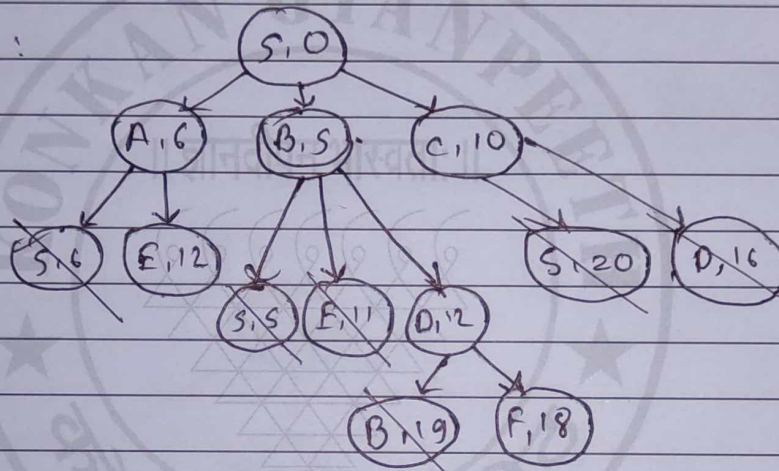
Step 3 :-



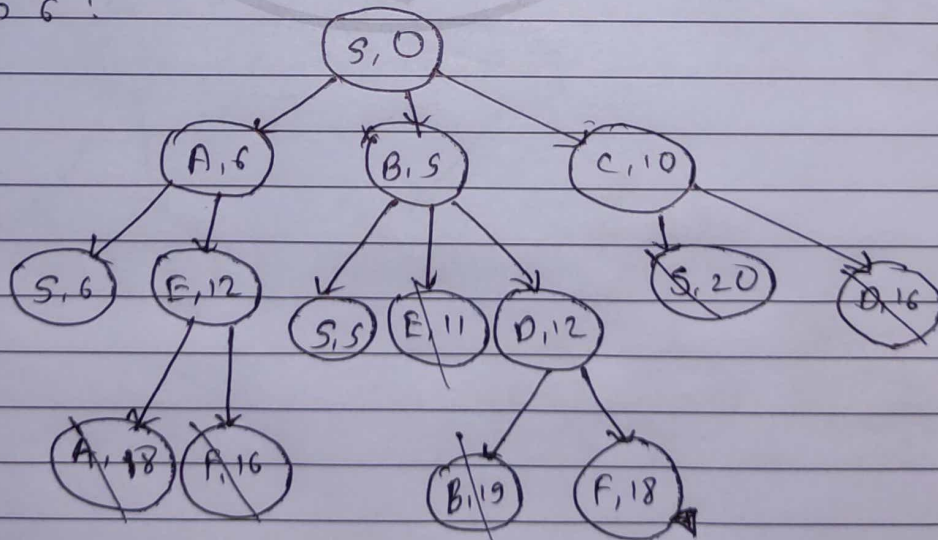
Step 4:-



Step 5 :

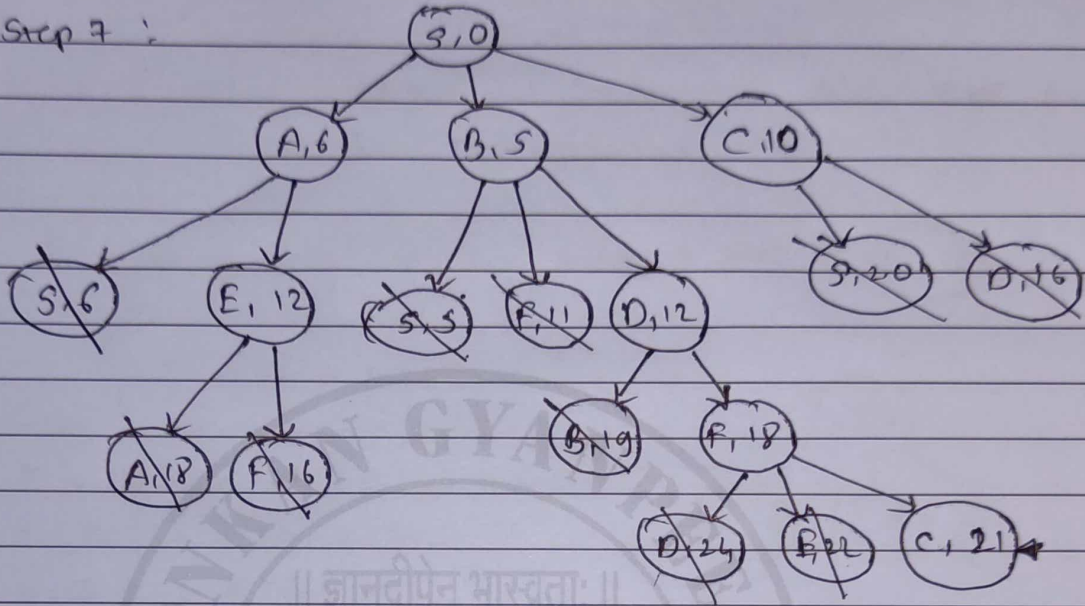


Step 6 :

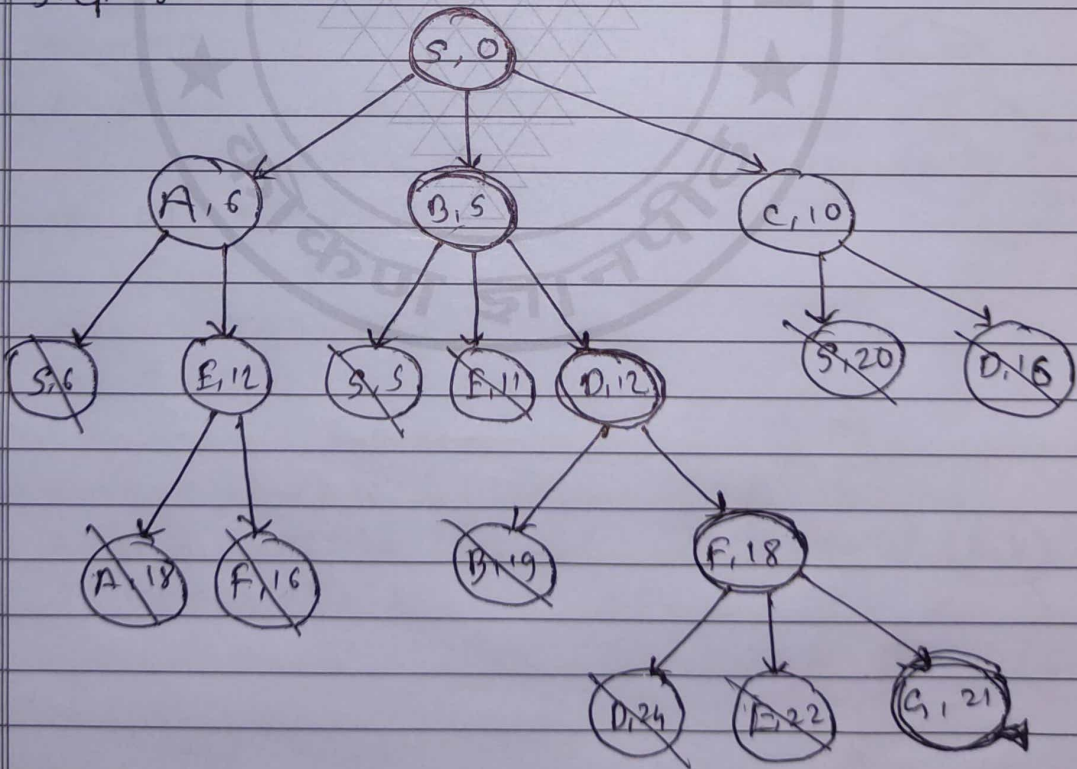


[illegible]

Step 7 :



Step 8



1.4) →

Initialization: computer F-source for S, put it in openlist.

F-source is $F(S) = h(S) = 17$ (S, 17)

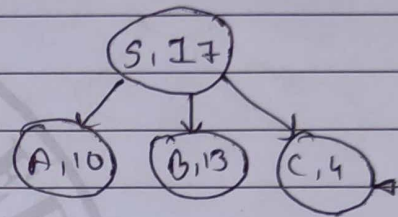
Step 1:

F = source of successors

$$F(A) = h(A) = 10$$

$$F(B) = h(B) = 13$$

$$F(C) = h(C) = 4$$

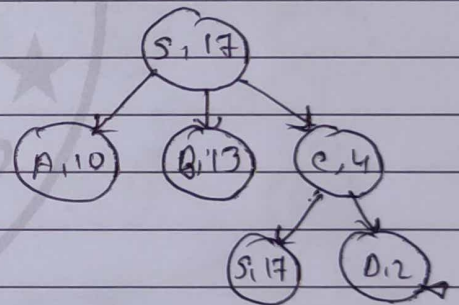


Step 2:

F-source of successors

$$F(S) = h(S) = 17$$

$$F(D) = h(D) = 2$$



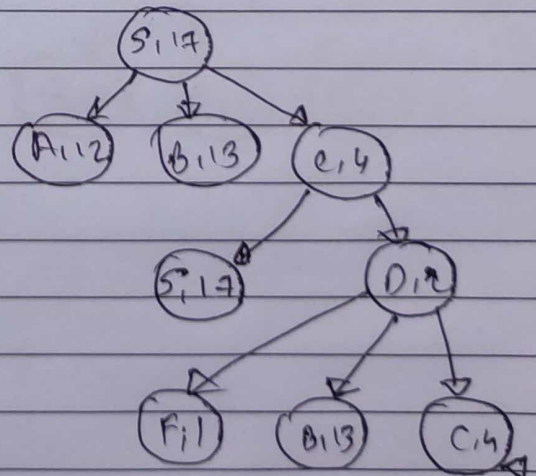
Step 3:

F-source of Successor

$$F(C) = h(C) = 4$$

$$F(B) = h(B) = 13$$

$$F(P) = h(P) = 1$$



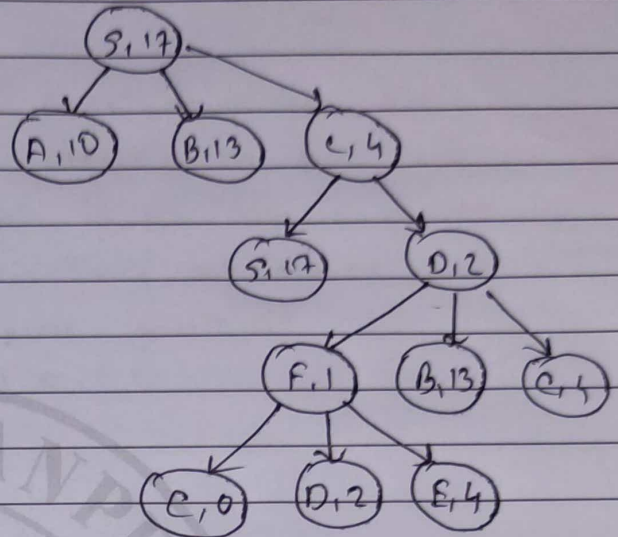
Step 4 :

P - source of successor

$$P(D) = h(D) = 2$$

$$P(E) = h(E) = 4$$

$$P(G) = h(G) = 0$$



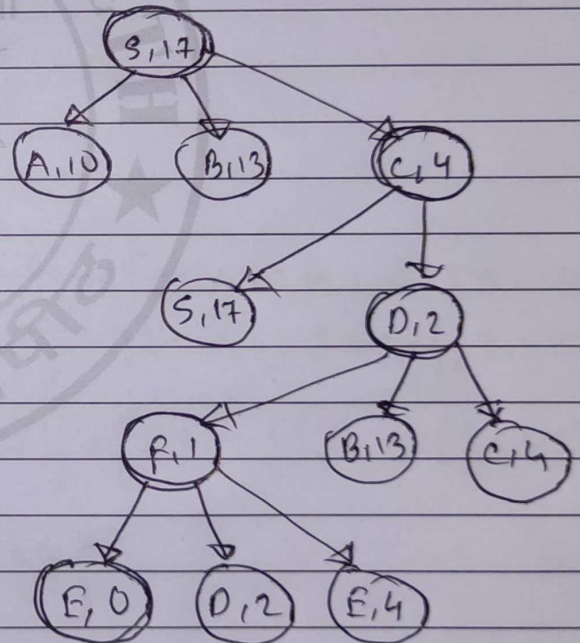
Step 5 :

Solution is

$S \rightarrow C \rightarrow F \rightarrow G$ with

Solution : $10 + 6 + 6 + 3$

$\Rightarrow 25$



Q-2)

a)

lowest path $g(n)$ can be cost to reach goal configuration in least steps in our case, we can reach final configuration in at least 4 moves.

UP, UP, LEFT, LEFT. Since all moves are equally costly, we compute $g(n)$ as

$$g(n) = 1 + 1 + 1 + 1$$

$$g(n) = 4$$

Consider foll. 3-puzzle instance

8	7	6
2	1	5
-	3	4

Solution can be represented as.

$\{ \{ 8, 7, 6 \} \{ 2, 1, 5 \} \{ -, 3, 4 \} \} \rightarrow \{ \{ 8, 7, 6 \} \{ 2, 1, 5 \} \{ 3, -, 4 \} \}$
 $\rightarrow \{ \{ 8, 7, 6 \} \{ 2, 1, 5 \} \{ 3, 4, - \} \} \rightarrow \{ \{ 8, 7, 6 \} \{ 2, 1, - \} \{ 3, 4, 5 \} \}$
 $\rightarrow \{ \{ 8, 7, - \} \{ 2, 1, 5 \} \{ 3, 4, 5 \} \} \rightarrow \{ \{ 8, -, 7 \} \{ 2, 1, 6 \} \{ 3, 4, 5 \} \}$
 $\rightarrow \{ \{ 8, 3 \} \{ 2, 1, 6 \} \{ 3, 4, 5 \} \}$

Since all moves are equally costly, cost would be

$$g(n) = 6$$

c)

8	7	6
2	1	5
3	4	-

Initial config.

left

up

8	7	6
2	1	5
3	-	4

8	7	6
2	1	-
3	4	5

left

up

right

up

left

right

8	7	6	8	7	6	8	7	6	8	7	6	8	7	6
2	1	5	2	-	5	2	1	5	2	-	1	2	-	1
-	3	4	3	1	4	3	4	-	3	4	5	3	4	5

down

8	-	7
2	1	6
3	4	5

8	7	6
2	1	-
3	4	5

left

down

right

-	8	7	8	1	7	8	7	-
2	1	6	2	-	6	2	1	6
3	4	5	3	4	5	3	4	5

Final configuration

e)

→ For $i=1$ $n = \text{initial state}$

$h_1(\text{initial}) = \text{misplaces tiles count}$
except space

$$h_1(\text{initial}) = 4$$

$n = \text{goal state}$

$$h_1(\text{goal}) = 0$$

for $i=2$ $n = \text{initial state}$

$$h_2(\text{initial}) = 4$$

for $n = \text{goal state}$

$$h_2(\text{goal}) = 8$$

for $i=3$, $n = \text{initial state}$

$h_3(\text{initial}) = \text{sum of dist. between current}$
of correct position of all
tiles except space.

$$h_3(\text{initial}) = 0 + 0 + 0 + 0 + 1 + 1 + 1 + 1$$

$$= 4$$

for $n = \text{goal state}$

$$h_3(\text{goal}) = 0$$