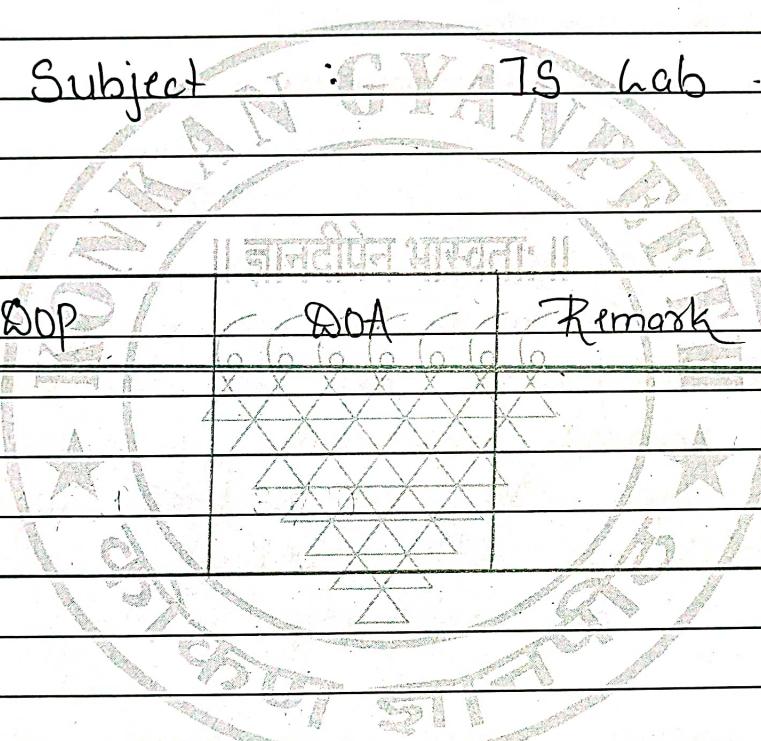


Name : Ruchi R. Shaikh

Class : BE - IT

Roll no : 59

Subject : TS - lab



DOP

DOA

Remark

Sign

10.10.10.10.10.10.10.

x x x x x x

10.10.10.10.10.10.

10.10.10.10.10.10.

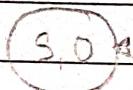
X X X X X X

10.10.10.10.10.10.

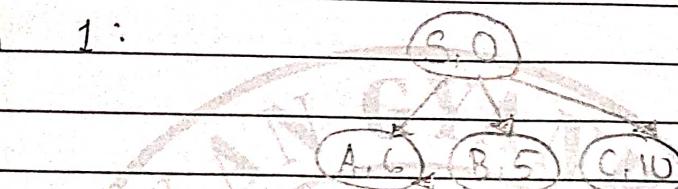
Q. 1.

1.1]

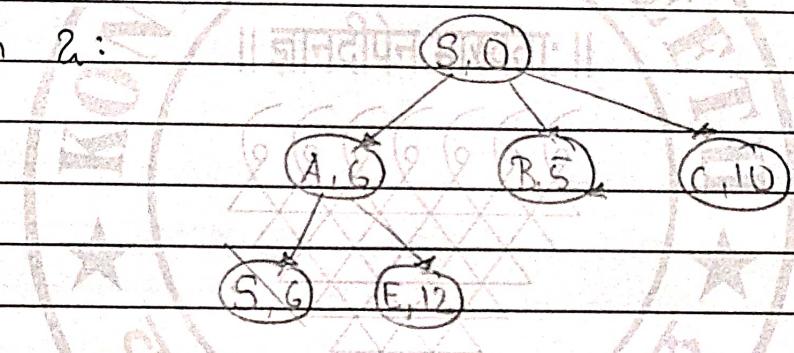
Step 0 :



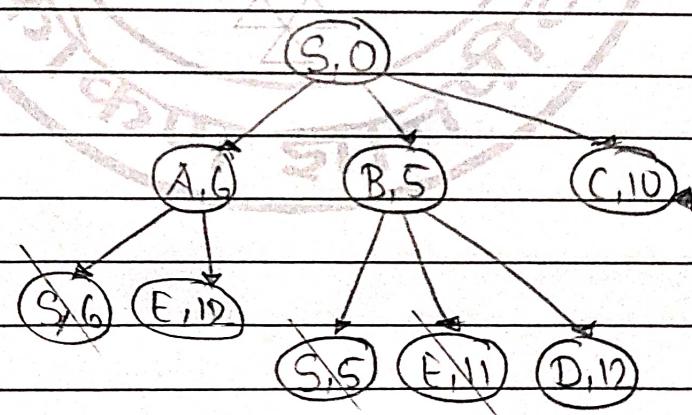
Step 1 :



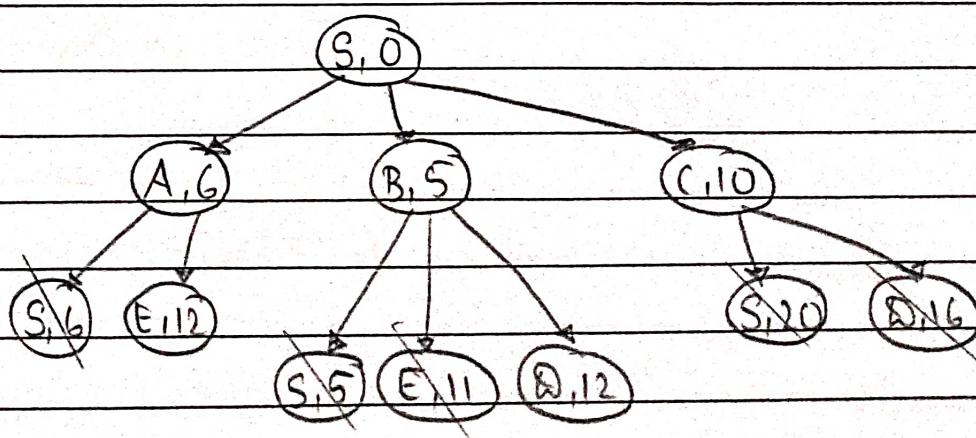
Step 2 :



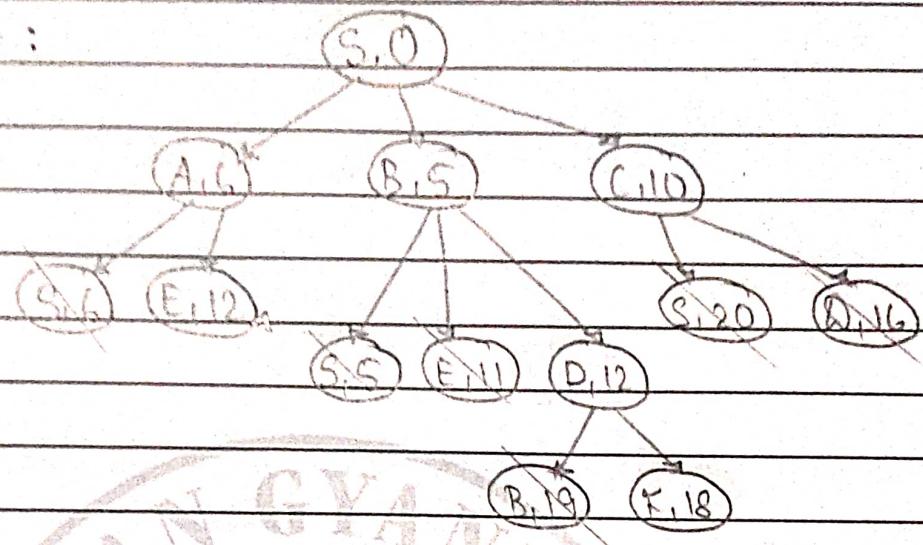
Step 3 :



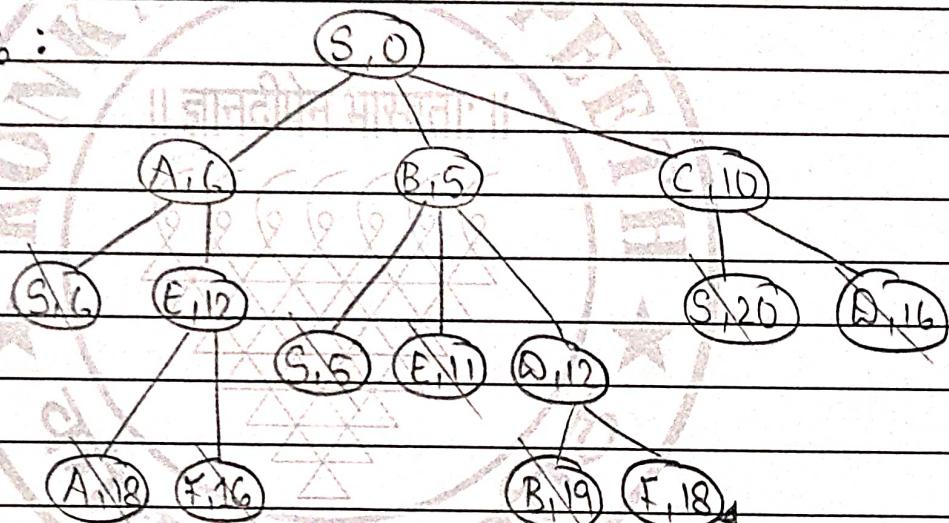
Step 4 :



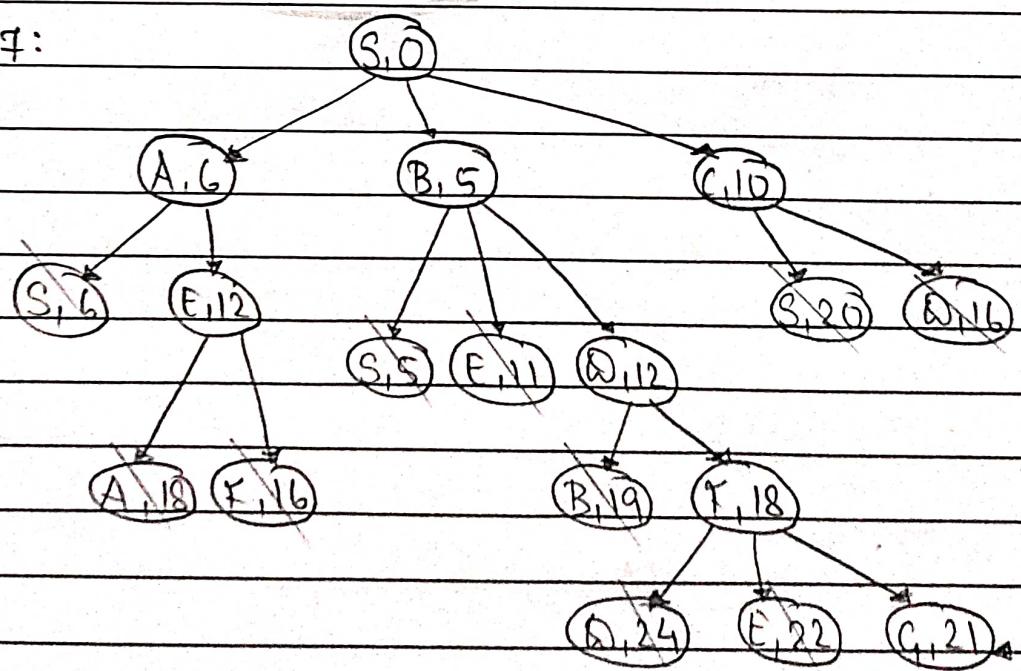
Step 5:



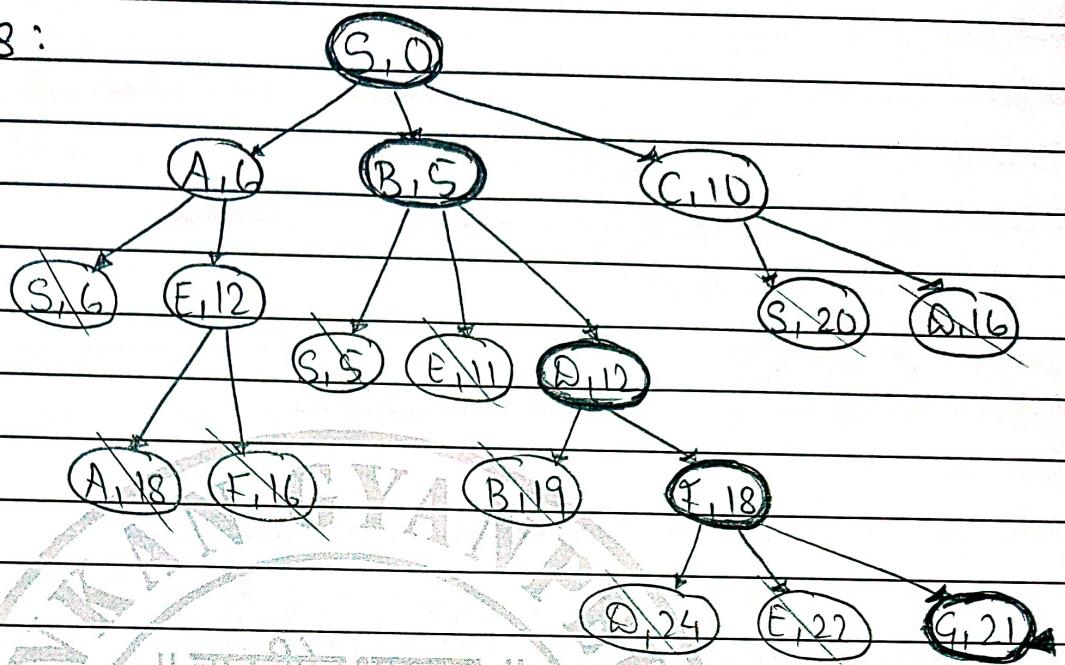
Step 6:



Step 7:



Step 8:



1.4]

Initialization : Compute f-score for S & put it in the openlist.

$$f\text{-score of } S : f(S) = h(S) = 17$$

(S, 17)

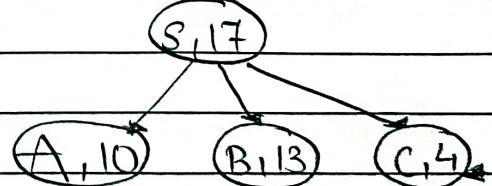
Step 1:

f-score of successors

$$f(A) = h(A) = 10$$

$$f(B) = h(B) = 13$$

$$f(C) = h(C) = 4$$

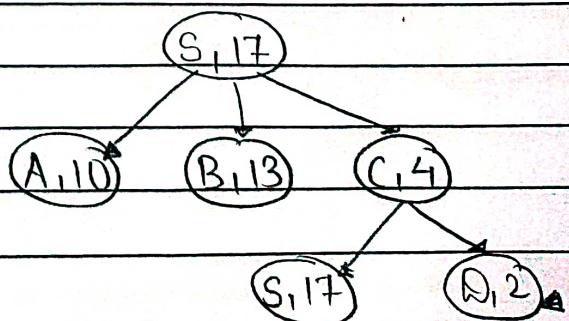


Step 2:

f-score of successors

$$f(S) = h(S) = 17$$

$$f(D) = h(D) = 2$$



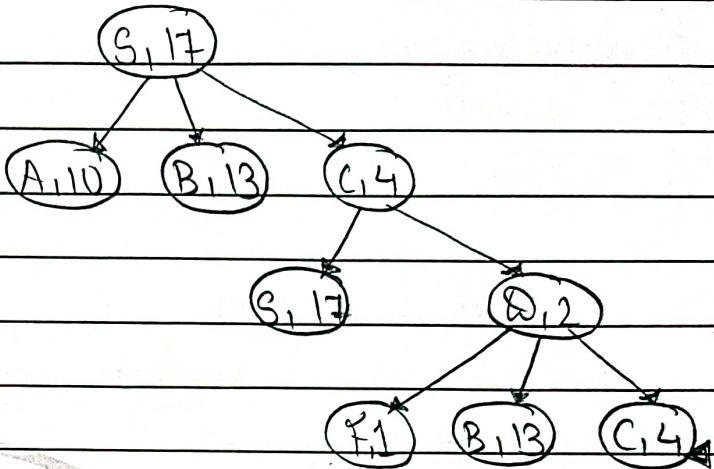
Step 3 :

F - score of Successor

$$f(C) = h(C) = 4$$

$$f(B) = h(B) = 13$$

$$f(F) = h(F) = 1$$



Step 4 :

F - score of Successor

$$f(Q) = h(Q) = 11$$

$$f(E) = h(E) = 4$$

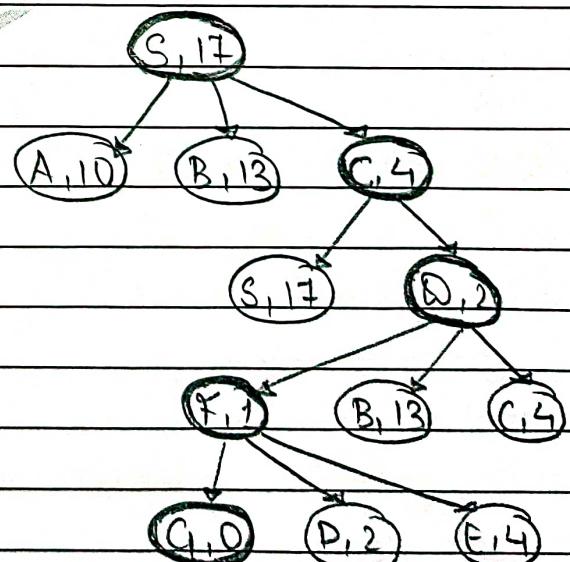
$$f(G) = h(G) = 0$$

Step 5 :

Ansut? is -

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

$$\text{Ansut? cost} : 10 + 6 + 6 + 3 \\ = 25$$



Q.

2)

a)



The lowest path cost  $g(n)$  can be the cost to reach the goal configuration in least steps.

In our case, we can reach the 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 the following 8-puzzle instance :

8	7	6	
2	1	5	
-	3	4	

Goal? can be represented as :

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

Since all the moves are equally costly the cost would be

$$g(n) = 6$$

5. Path cost : No of art's to reach the workshop

Corridor

cost

$\therefore$  Path cost = 8 direct + 4 stairs.

12

c]

8	7	6
2	1	5
3	4	-

initial config

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

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

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

left down right

	left	↓	down)		right.
-	8	7	8	1	7
2	1	6	2	-	6
3	4	5	3	4	5

Find configuration?

e)

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

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

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

$n = \text{goal state}$

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

For  $i = 2$ ,  $n = \text{initial state}$

$h_2(\text{initial}) = \text{incorrectly placed tiles count except space}$

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

For  $n = \text{goal state}$

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

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

$h_3(\text{initial}) = \text{sum of manhattan dist betw? current & correct posit? of all tiles except space}$

$$h_3(\text{initial}) = 0 + 0 + 0 + 0 + 1 + 1 + 1 + 1 \\ = 4$$

For  $n = \text{goal state}$

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