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Assignment 1A

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Roll no. : 34

Class : BE - IT

SUB : ISLAB

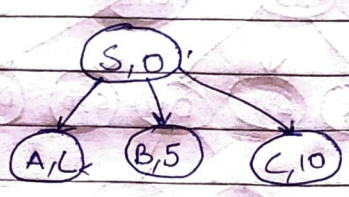
DOP	DOA	MARKS	SIGN

Q 4.

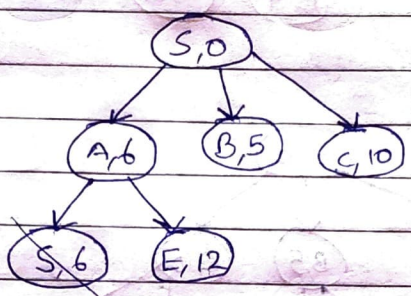
1.1]

→ Step 0 :

Step 1 :



Step 2 :



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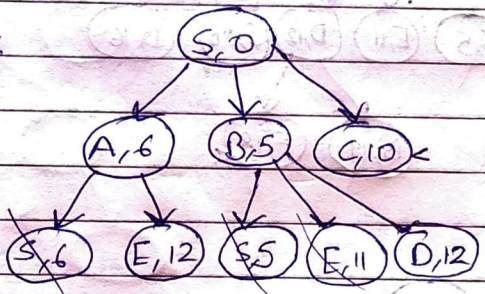
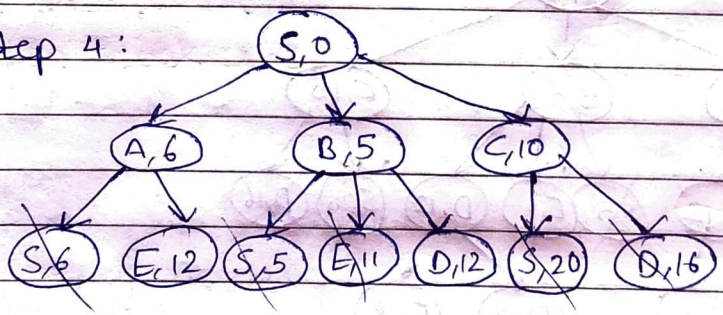


Step 4 :



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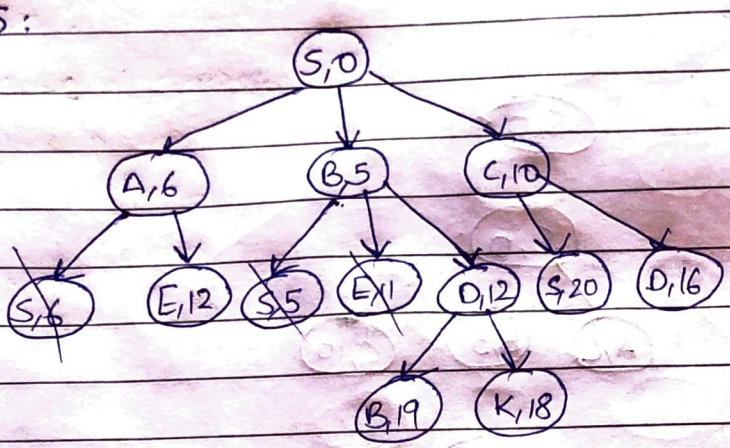

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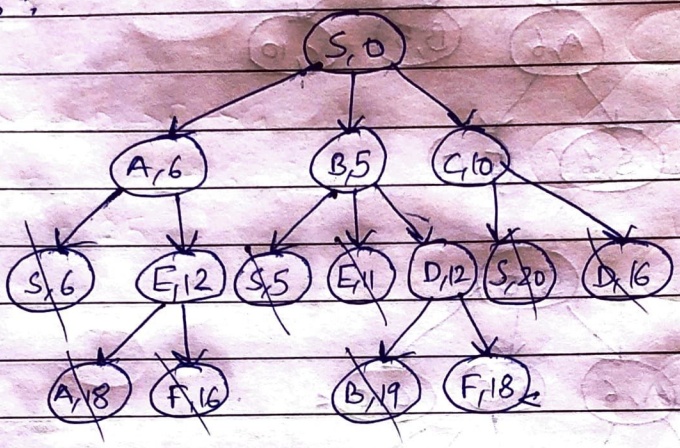

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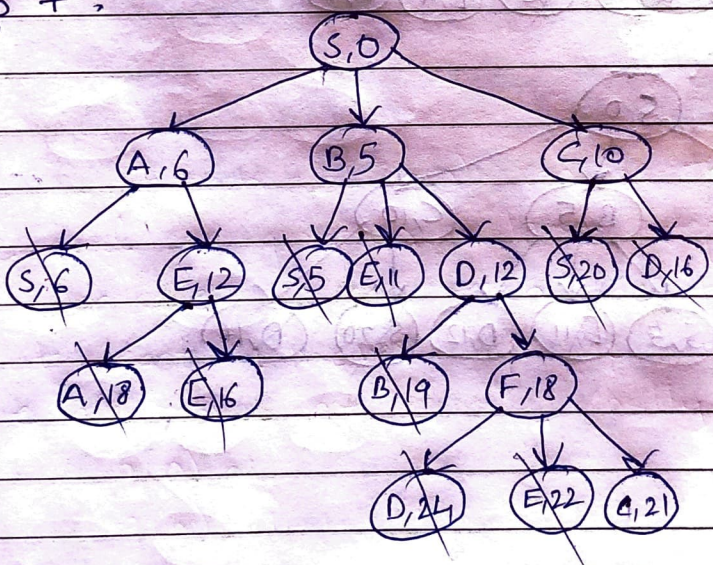
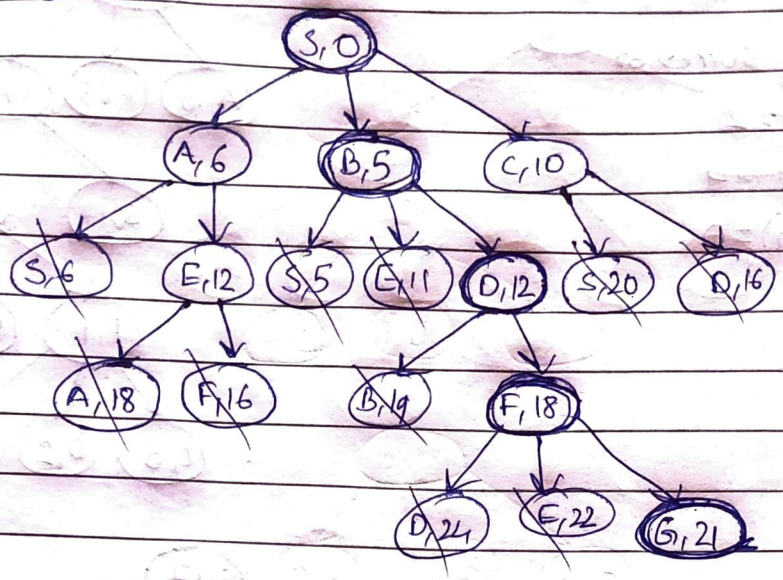


Step 8:



1.4]

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

F-sure S : $f(s) = h(s) = 17$ (S,17)

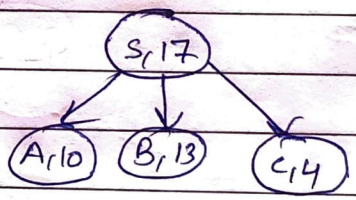
Step 1:

F-sure of successor

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

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

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

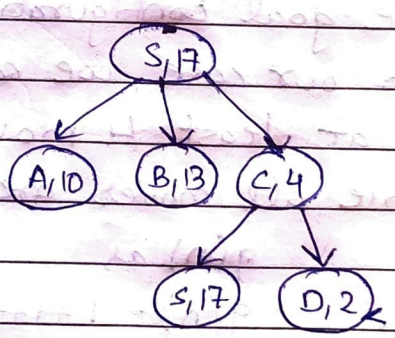


Step 2:

F-sure of successor

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

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



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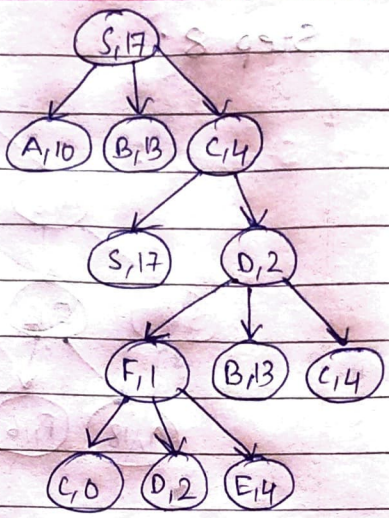
Step 4:

F-Sure of successor

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

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

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



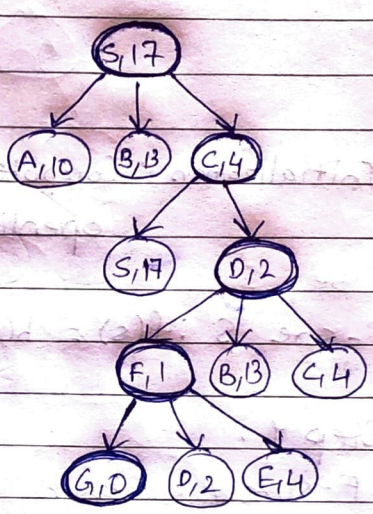
Step 5:

Sol^n is -

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

Sol^n 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

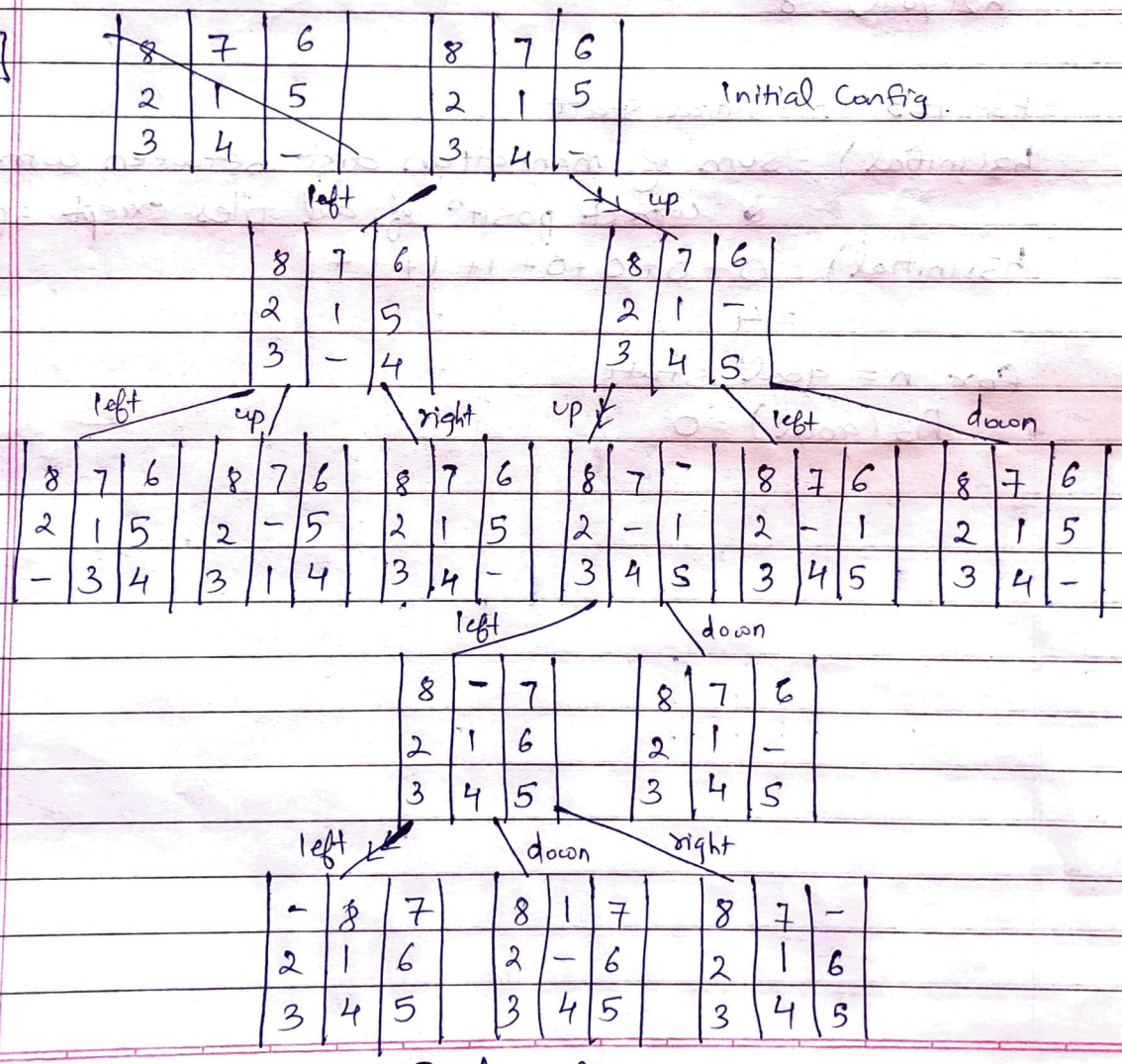
Soln can be represented as:

{{8,7,6} {2,1,5} {-,3,4}} → {{8,7,6} {2,1,5}, {3,-,4}} →
{{8,7,6} {2,1,5} {3,4,-}} → {{8,7,6} {2,1,-}, {3,4,5}} →
{{8,7,-} {2,1,5} {3,4,5}} → {{8,-,7} {2,1,6} {3,4,5}} →
{{-,8,7}, {2,1,6}, {3,4,5}}

Since all the moves are equally costly the cost would be

$g(n) = 6$.

c]



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e]

→ for i=1, n = initial state

h_1(Initial) = Misplaced tiles count except space

h_1(initial) = 4

n = goal state

h_1(goal) = 0

For i = 2, n = initial state

h_2(Initial) = Correctly placed tiles count except space

h_2(initial) = 4

for n = goal state

h_2(goal) = 8

For i=3, n = initial state

h_3(initial) = sum of manhattan dist between current & correct posit^n of all tiles except space.

h_3(initial) = 0+0+0+0+1+1+1+1

= 4

for n = goal state

h_3(goal) = 0