Assignment No.

Name :- Tanmay H. Shinde

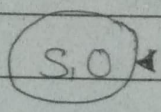
Class :- B.E. IT

Roll no :- 65

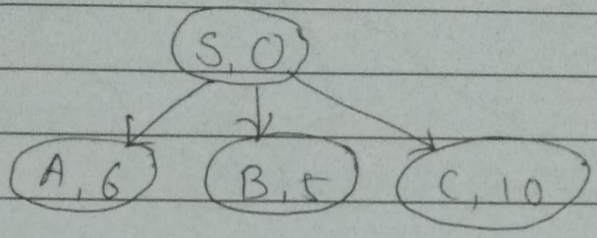
Subject :- AI

Q1

1.1] Step 0 :



Step-1 :



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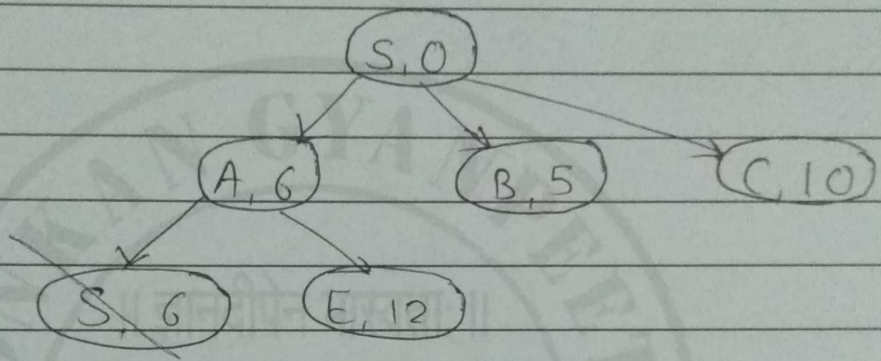
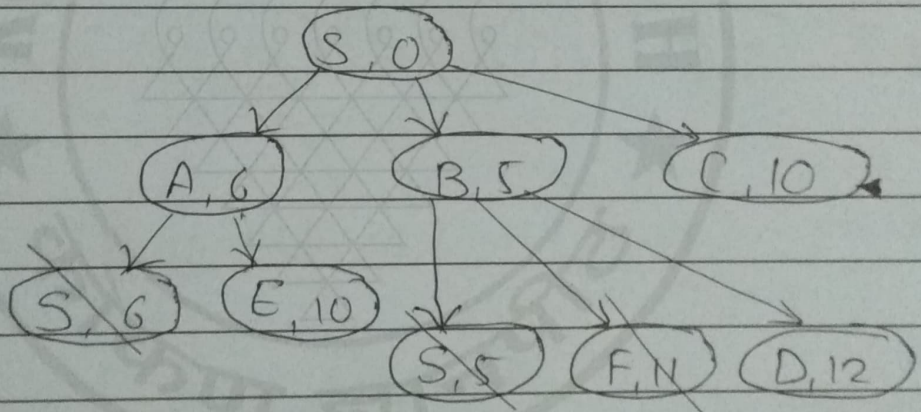


Step3 :



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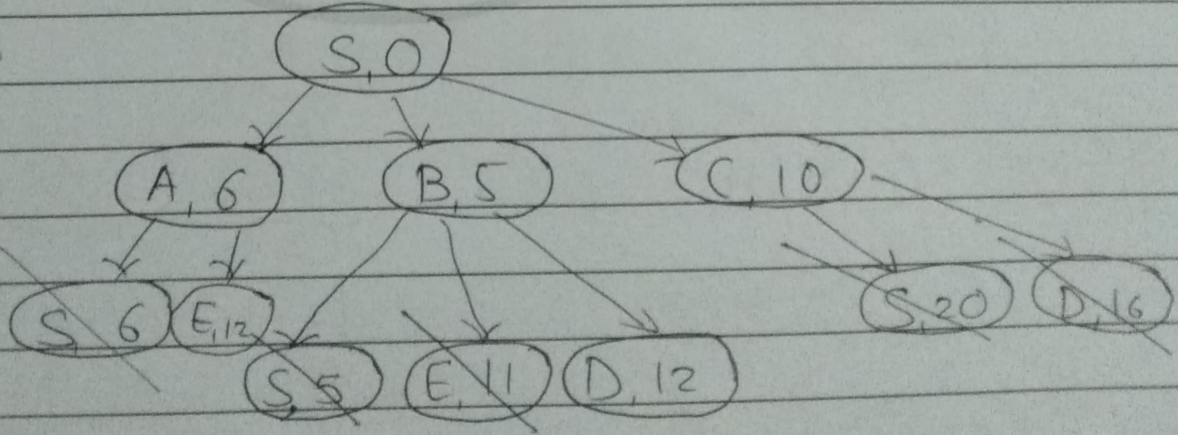

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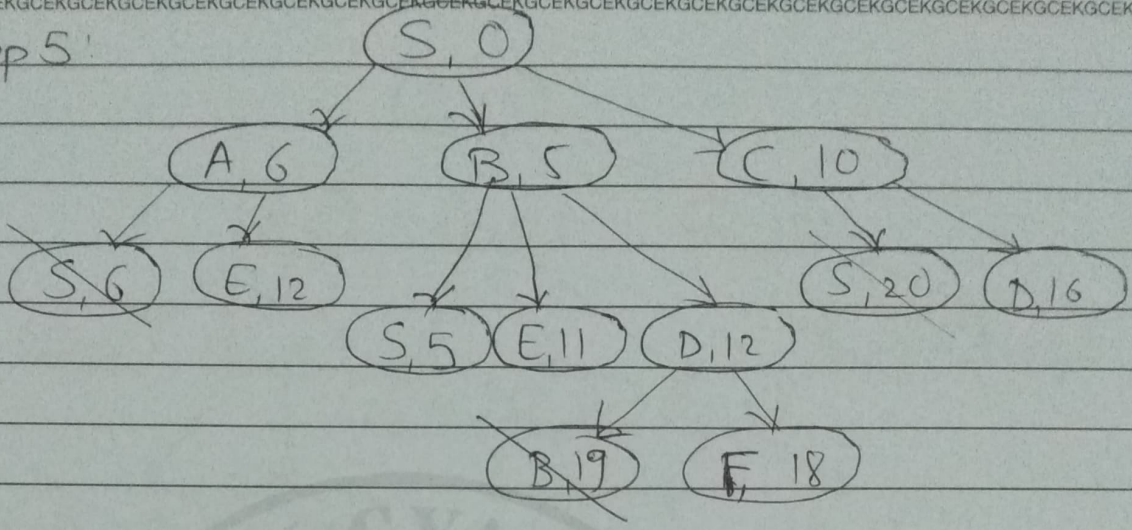

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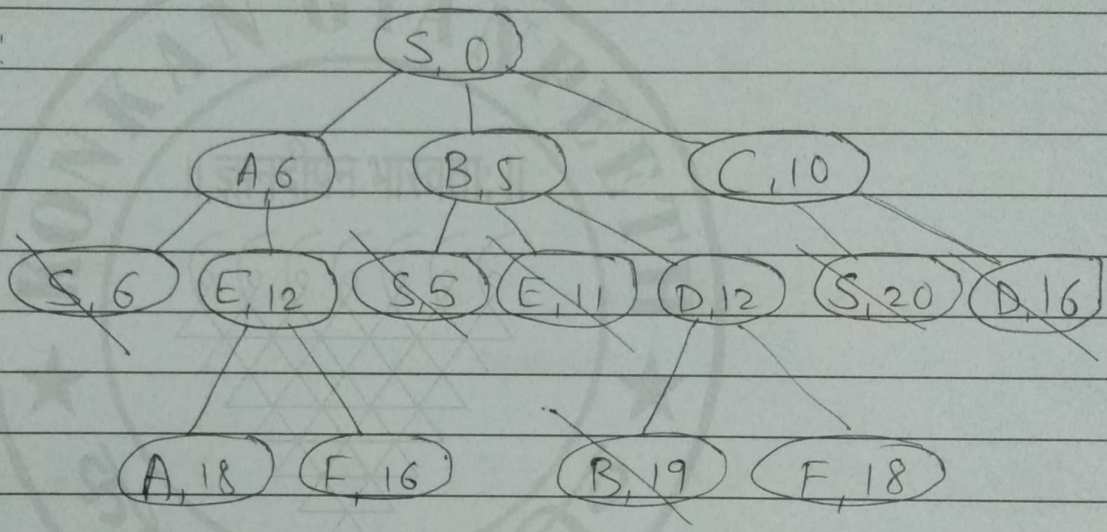

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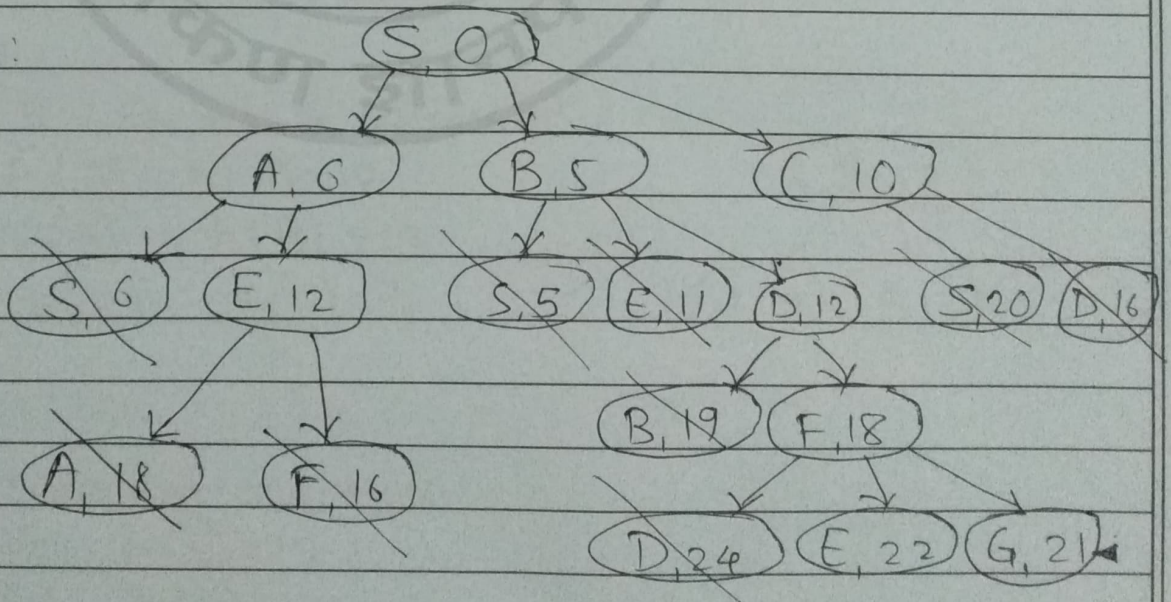

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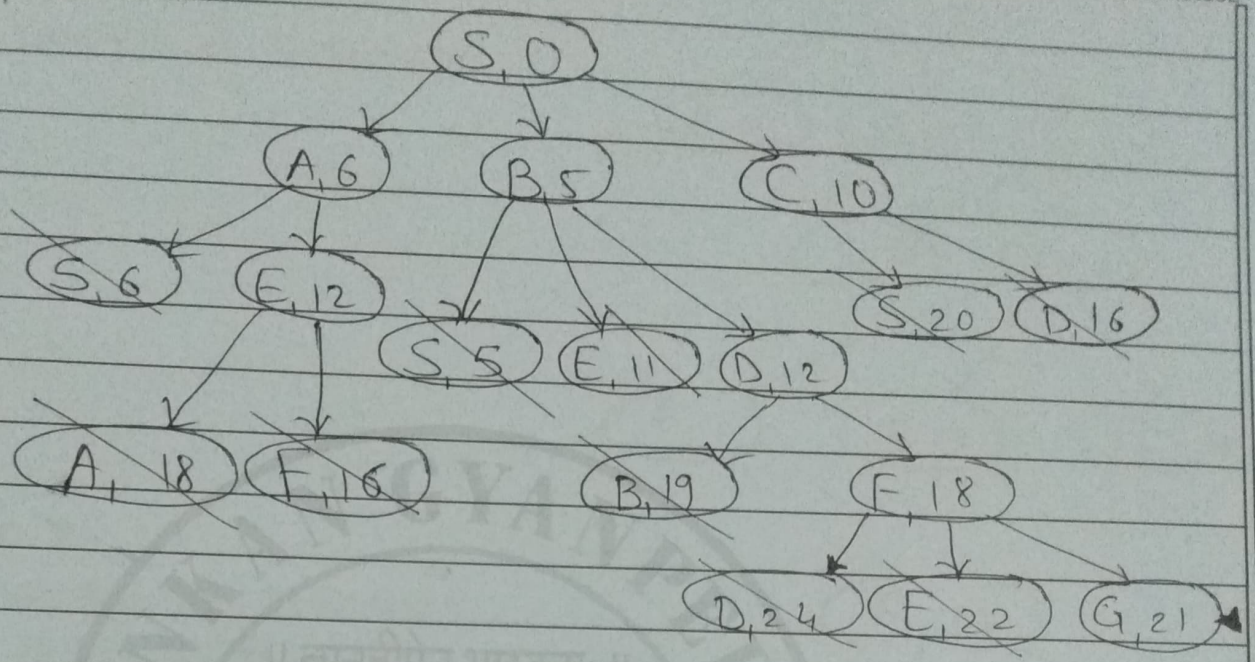
Step 8:



1.4 →

Initialization: Compute & F-source for S & put it in openlist.

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

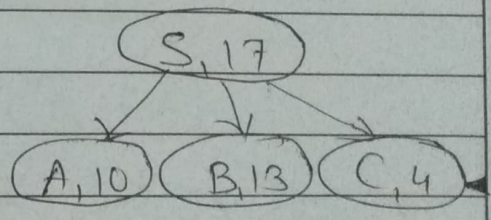
Step 1:

F - Source of successors

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

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

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

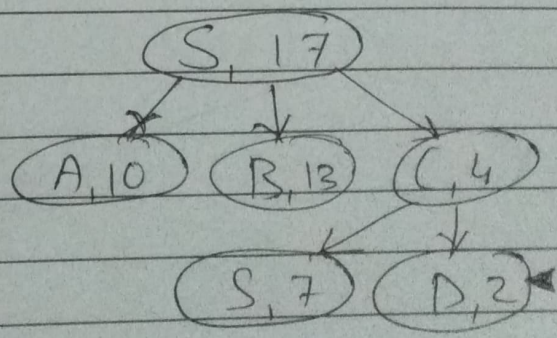


Step 2:

F source of successors

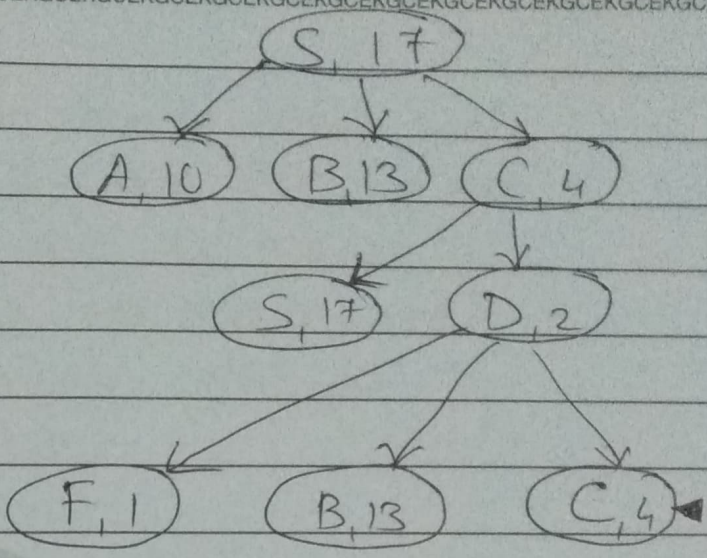
$F(S) = h(S) = 17$

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



Step 3:

F - Source of Successor



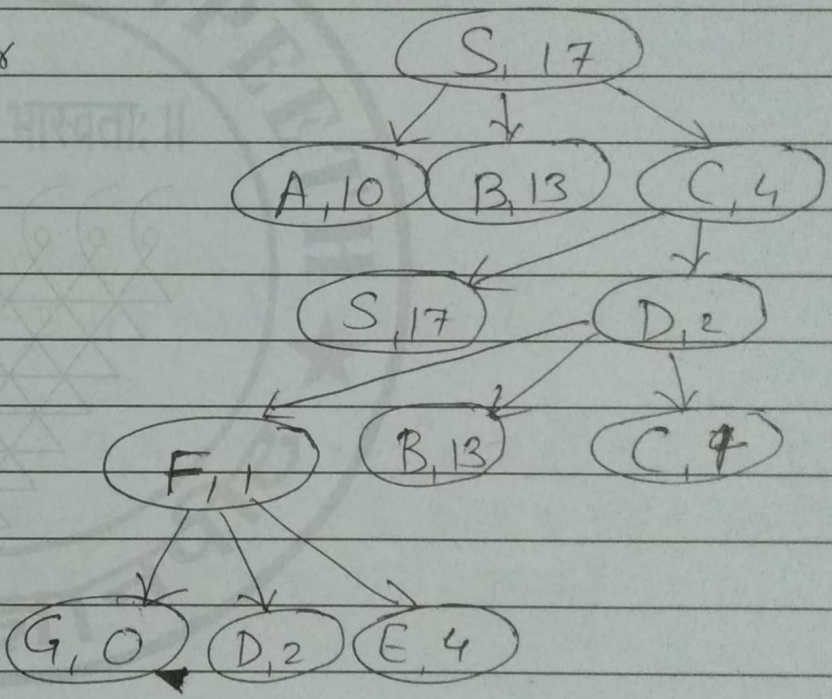
Step 4:

F source of successor

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

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

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



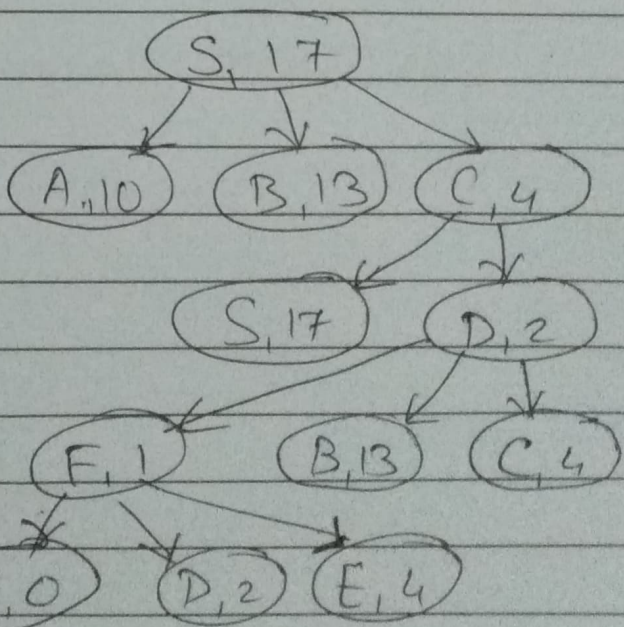
Step 5:

Soln is:

S → C → F → G with

Soln : 10 + 6 + 6 + 3

= 25



Q2)

a) Lowest path g(n) can be cost to reach goal configuration in least steps In our case, we can reach final conf" in at lost 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 full 8-puzzle instance

8	7	6
2	1	5
-	3	4

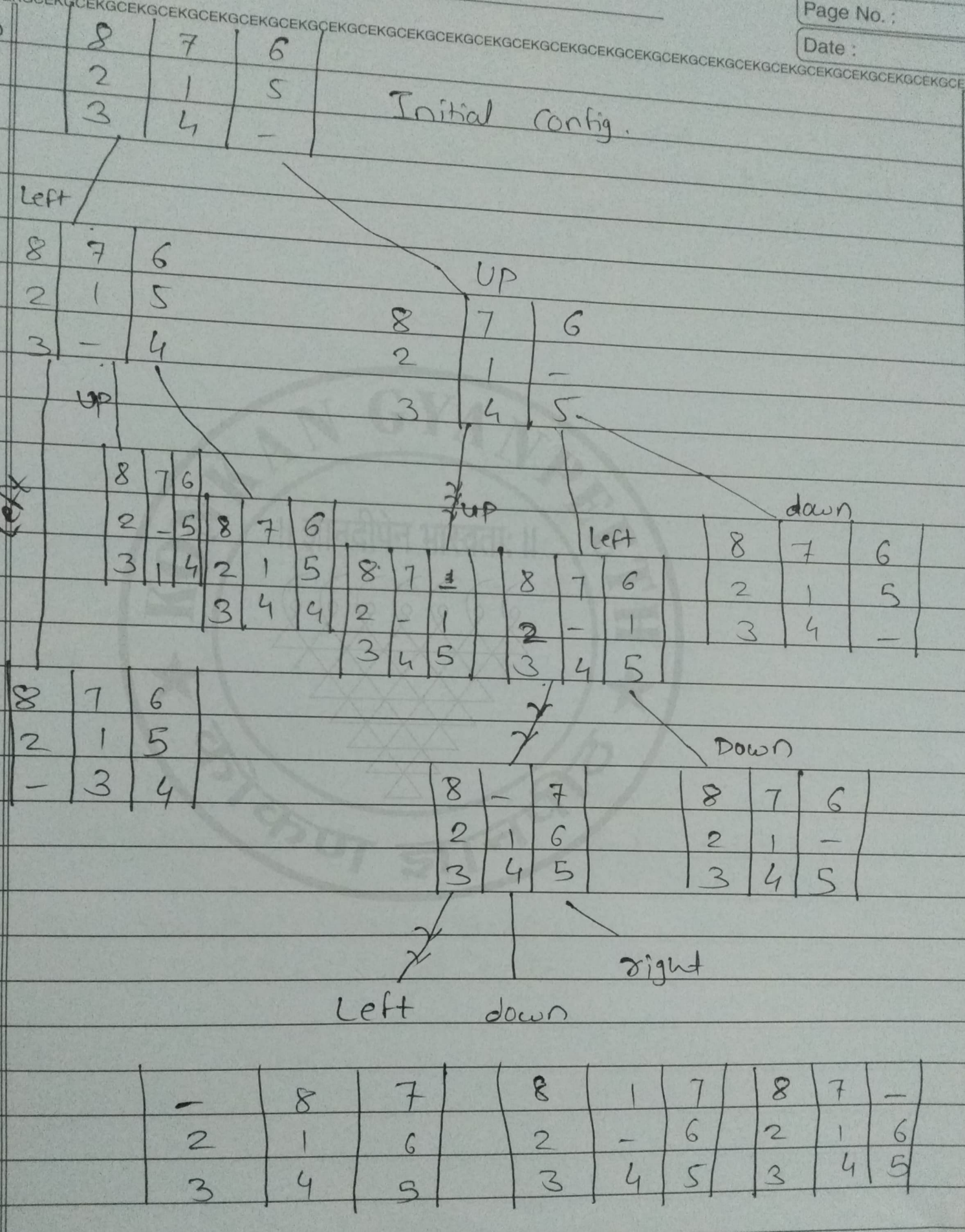
Soln can be represented as:

{ {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 moves are equally costly, cost would g(n) = 6



final configuration

e)→

for i=1 n = initial state

h_1(initial) = Misplace files count except space

h_2(initial) = 4

n = goal state

h_1(goal) = 0

For i=2, n= initial state

h_2(initial) = 4

for n = goal state

h_2(goal) = 8

for i = 3, n = initial state

h_3(initial) = sum of dist. betw^n Current & Correct posit^n

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

= 4

for n = goal state

h_3(goal) = 0