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Class : BE - II

Roll No : 08

Subject : IS Lab

Dop	DOA	Remark	Sign

Assignment - 1(A)

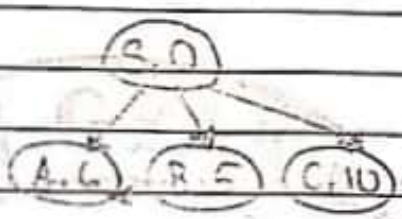
Q. 1.

1.1)

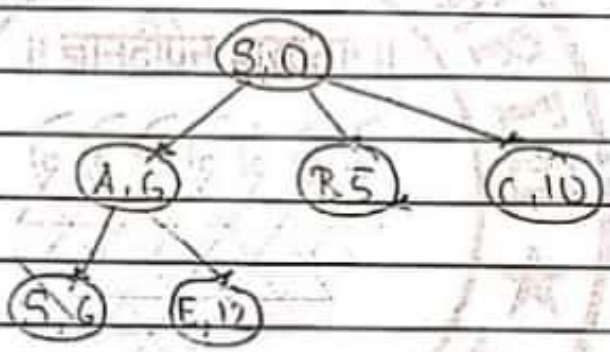
→

Step 0:

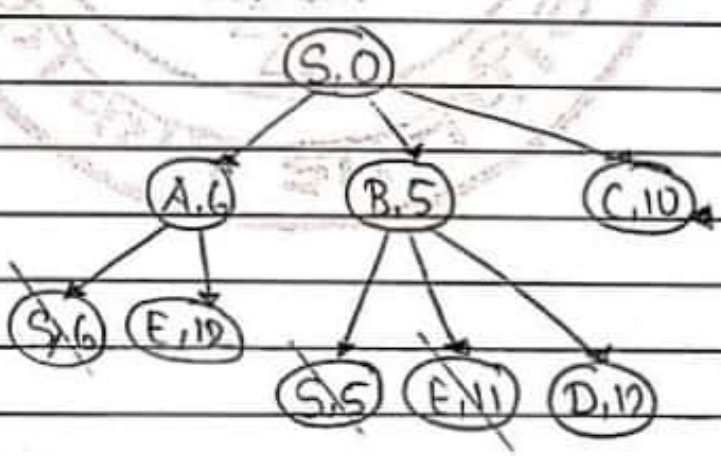
Step 1:



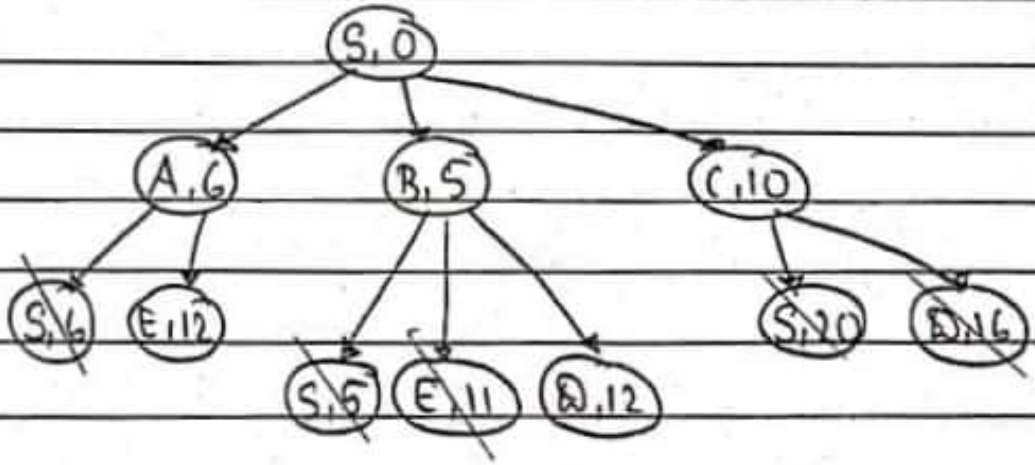
Step 2:



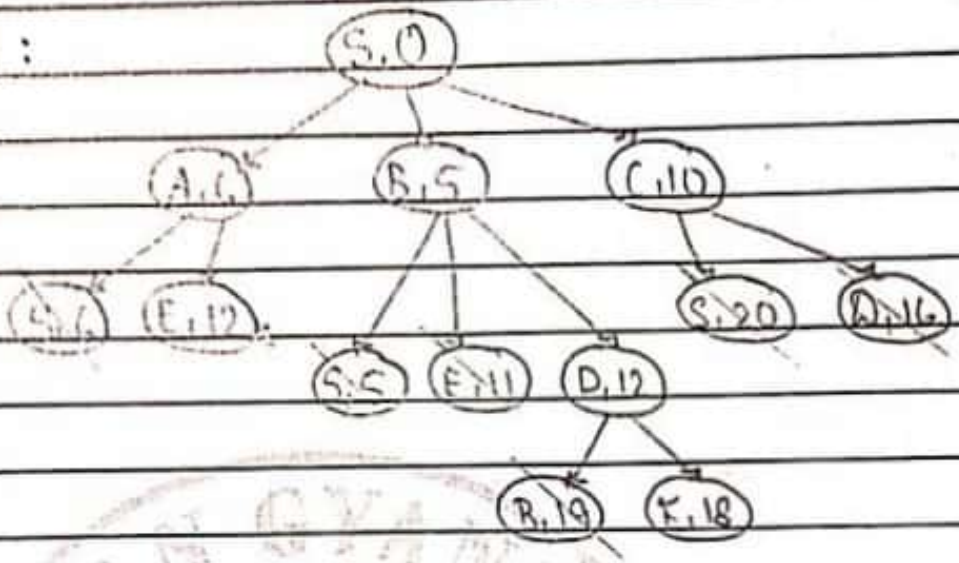
Step 3:



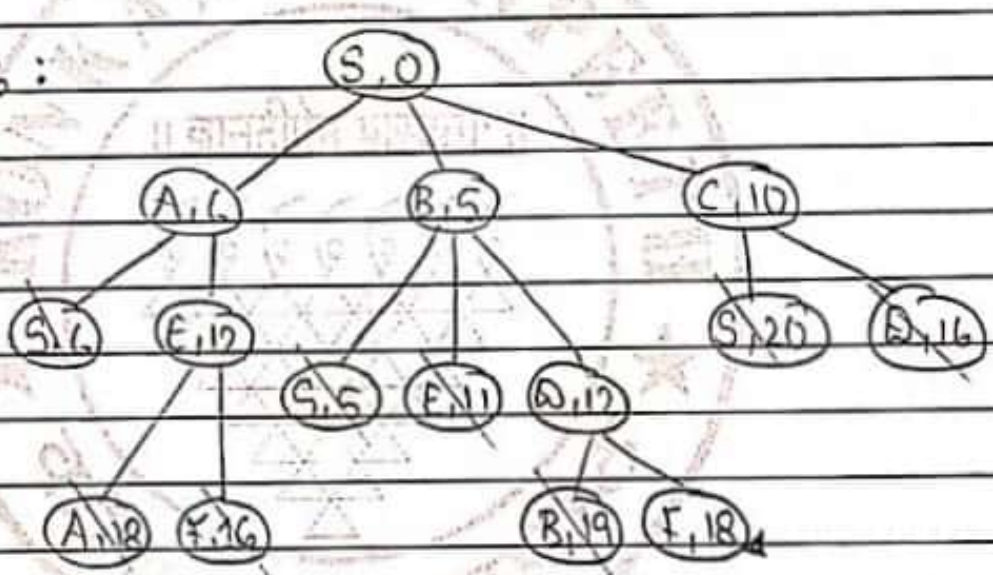
Step 4:



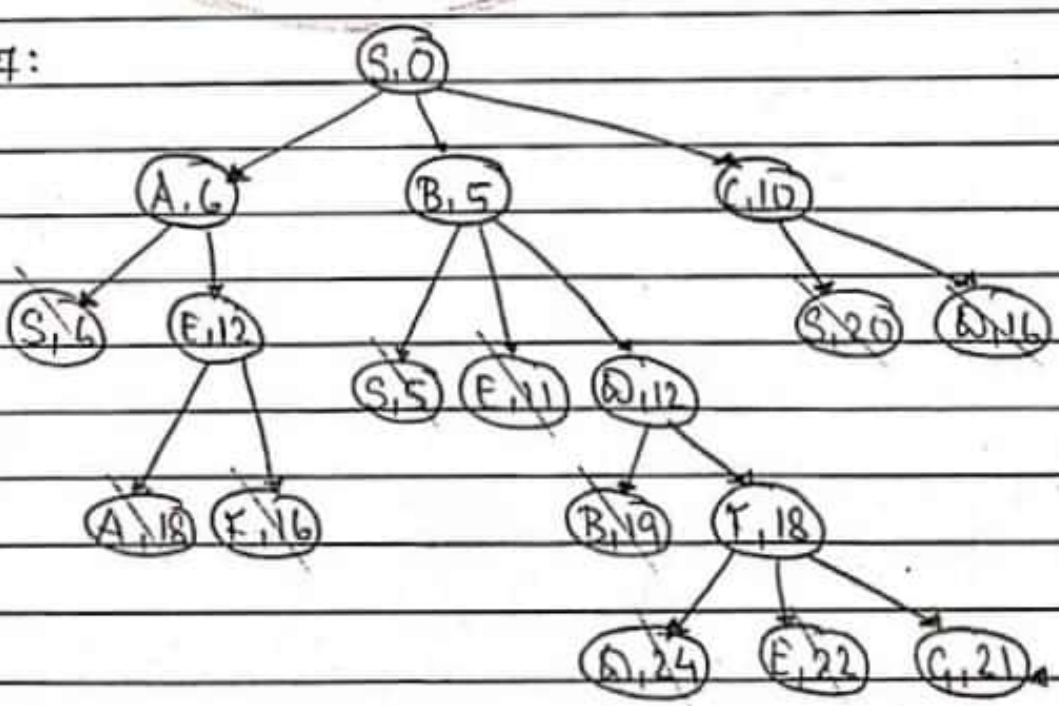
Step 5 :



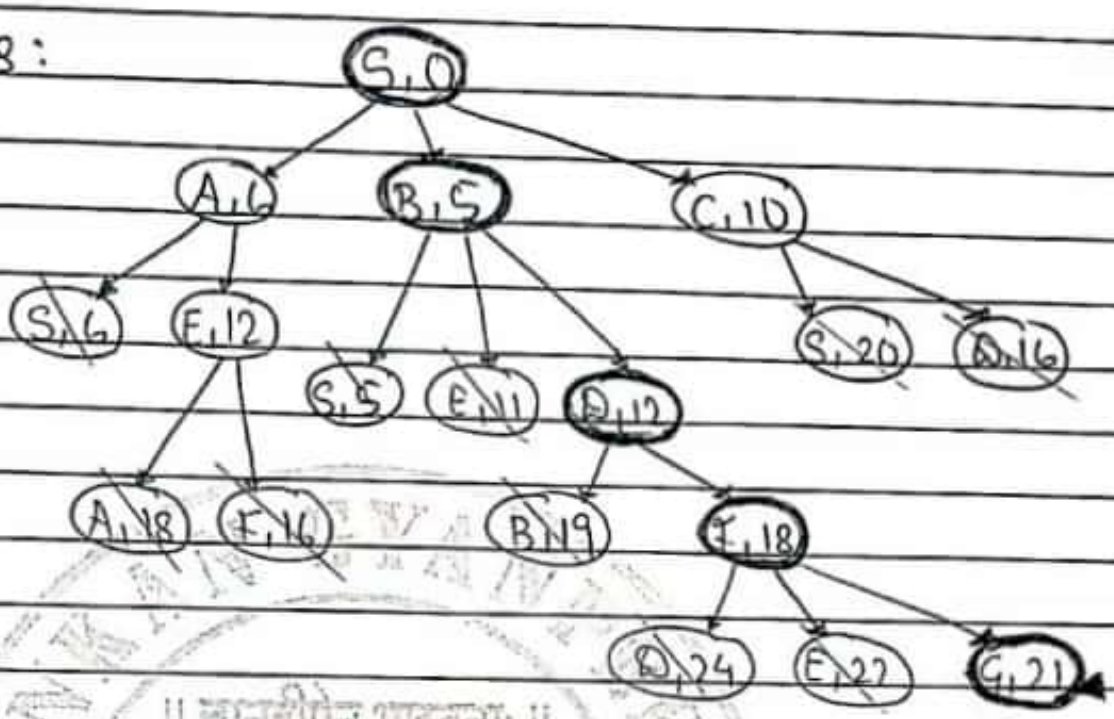
Step 6 :



Step 7 :



Step 8:



1.4)

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

f-value S : $f(S) = h(S) = 17$

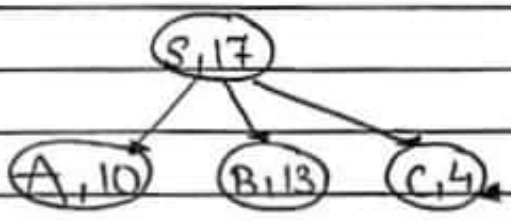
Step 1:

f-value of successors

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

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

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

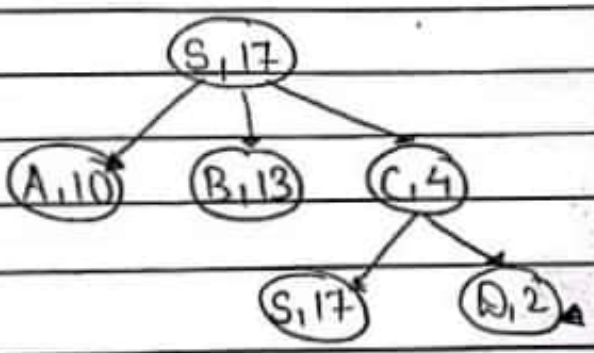


Step 2:

f-value of successors

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

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



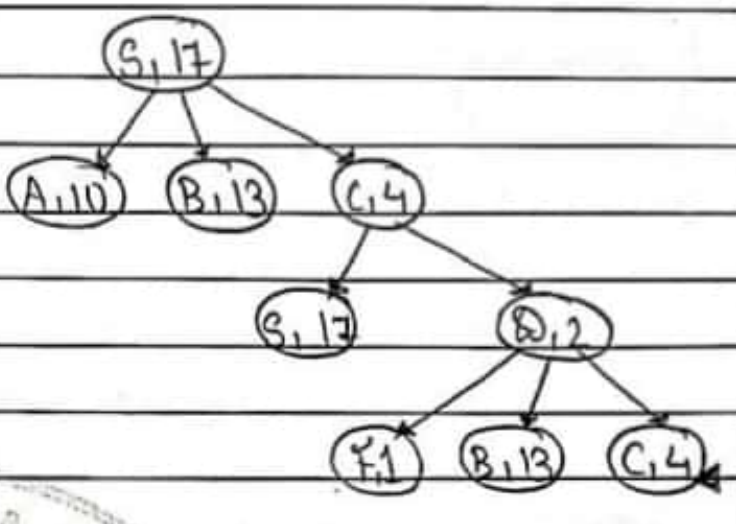
Step 3:

f - score of successor

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

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

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



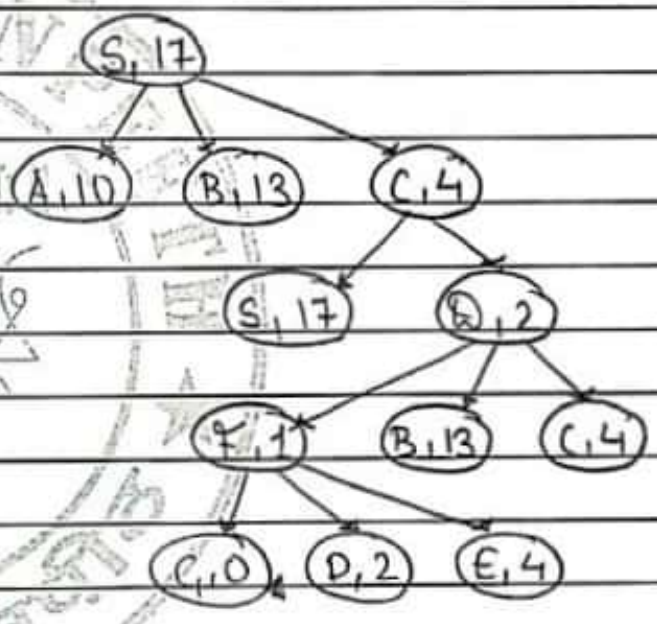
Step 4:

f - score of successor

$f(D) = h(D) = 12$

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

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



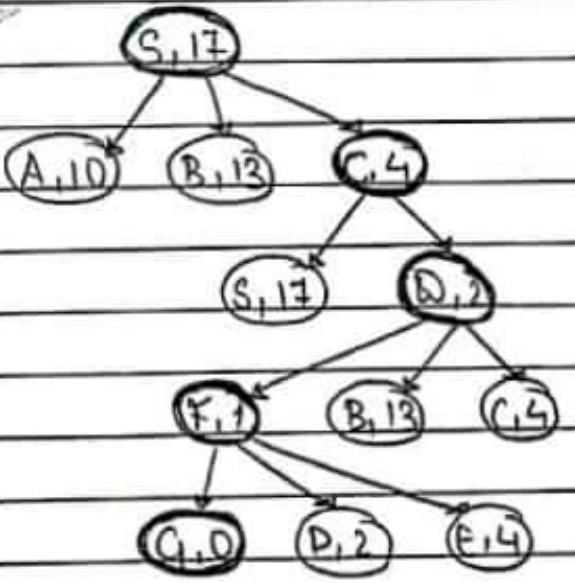
Step 5:

Solut^ is -

S → C → D → F → G with

Solut^ 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 configured in at last 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

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

$g(n) = C_0$.

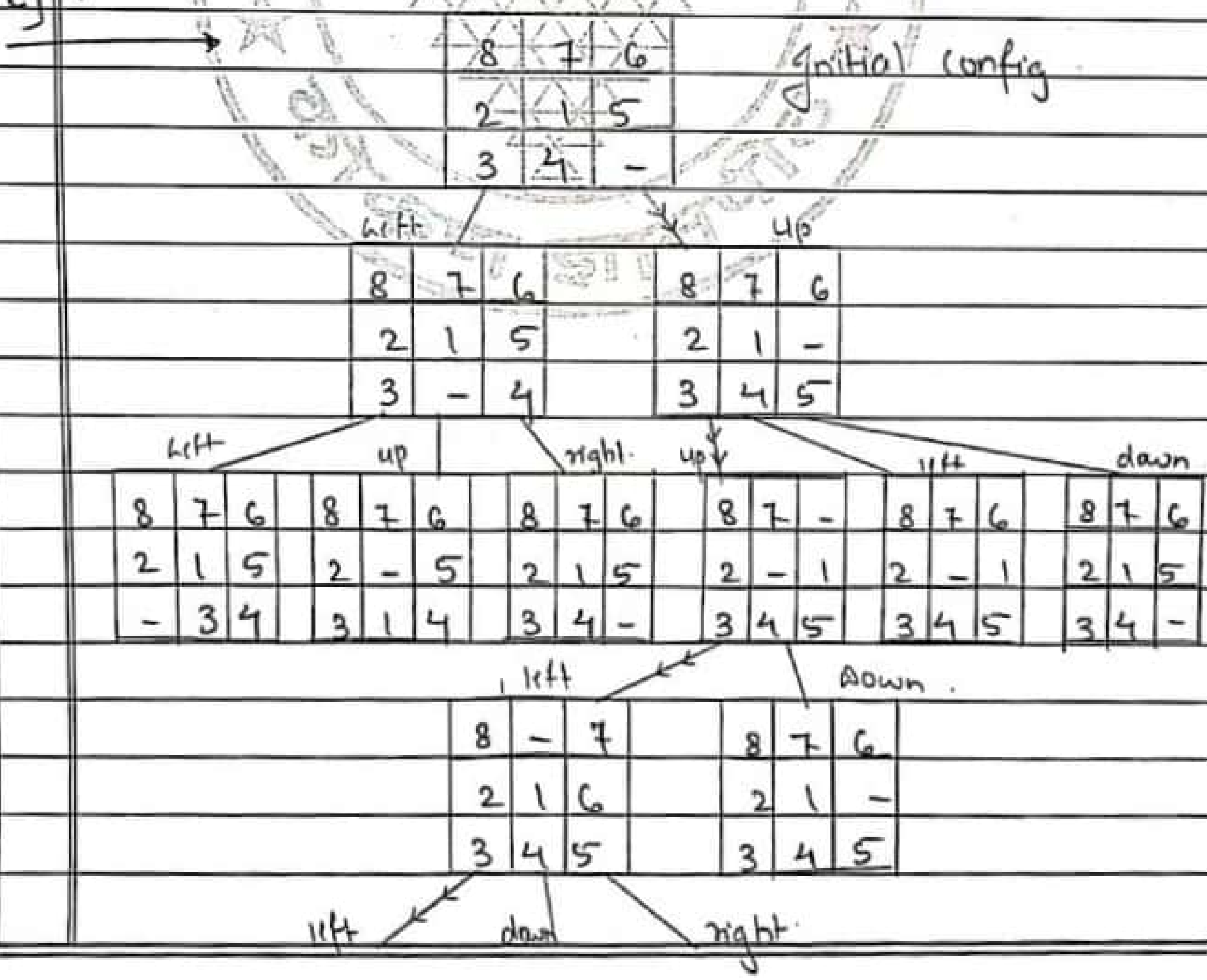
corridor .

5. Path cost : ~~No of act^n to reach the workshop~~

∴ Path cost = 8 direct^n + 4 staircases .

= 12

c] !



left

-	8	7
2	1	6
3	4	5

down

8	1	7
2	-	6
3	4	5

right

8	7	-
2	1	6
3	4	5

Final configurat^n.

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 replaced 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 betw^n 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