Name : Rituraj k. Gharat

Class : BE-IT

RollNO : 18

subject : Islab

DOP DOA Marks SIGN

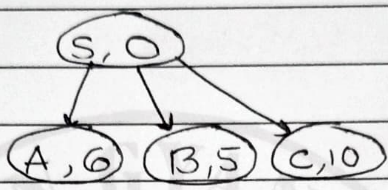
Assignment -1(A)

Q 1

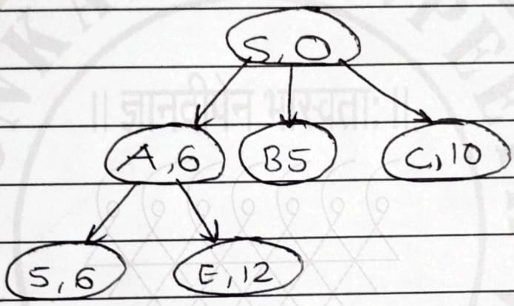
1.1] →

Step 0 :

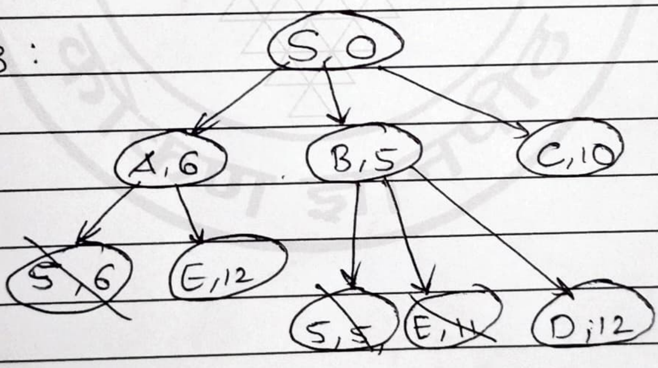
Step 1 :



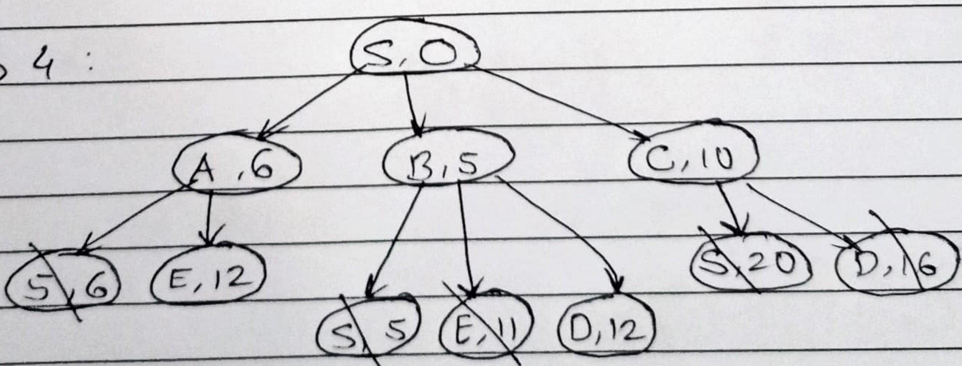
Step 2 :



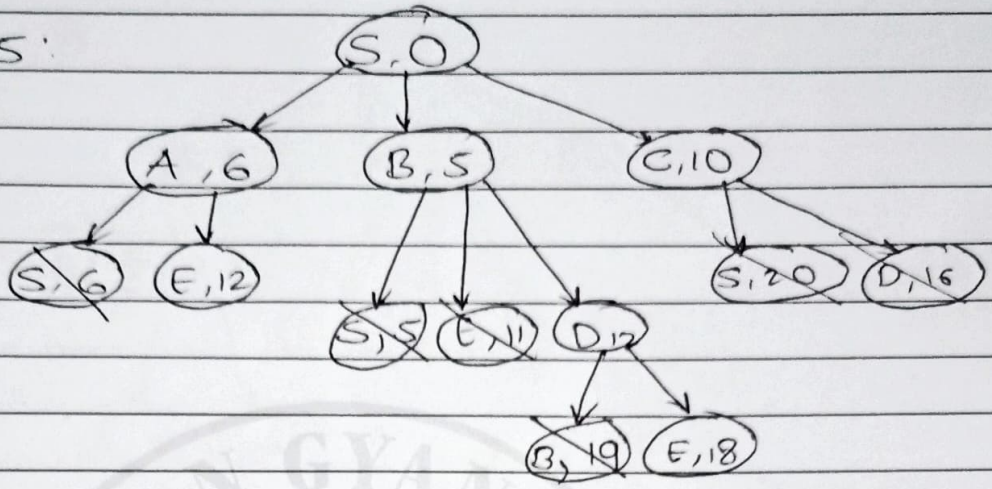
Step 3 :



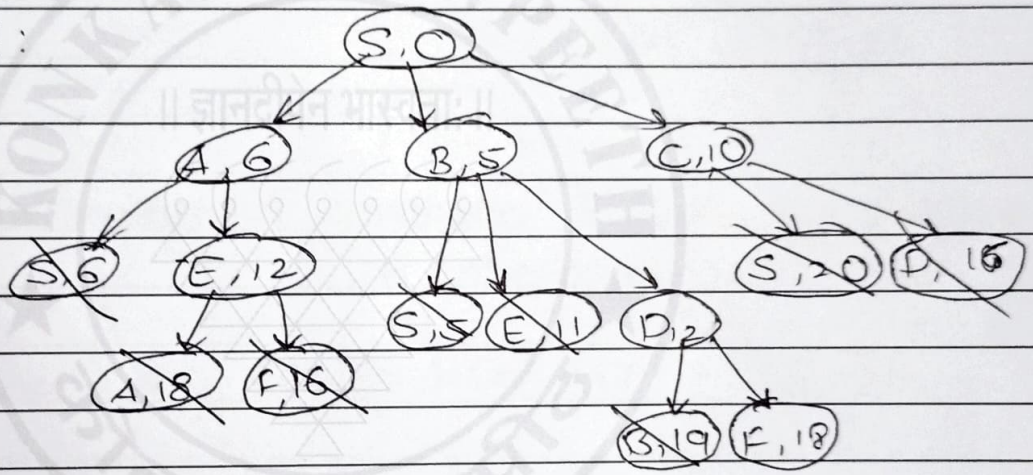
Step 4 :



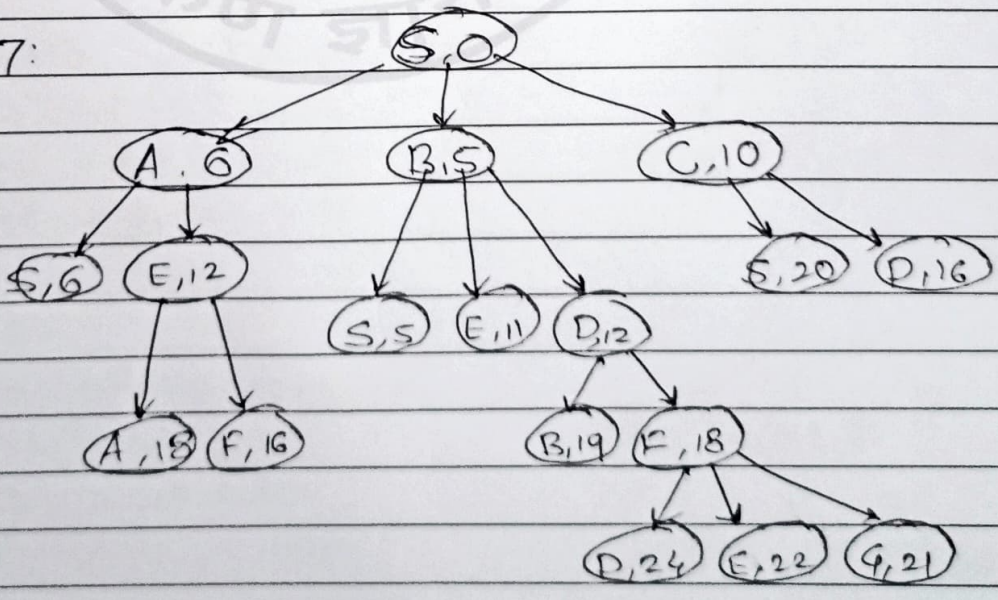
Step 5:



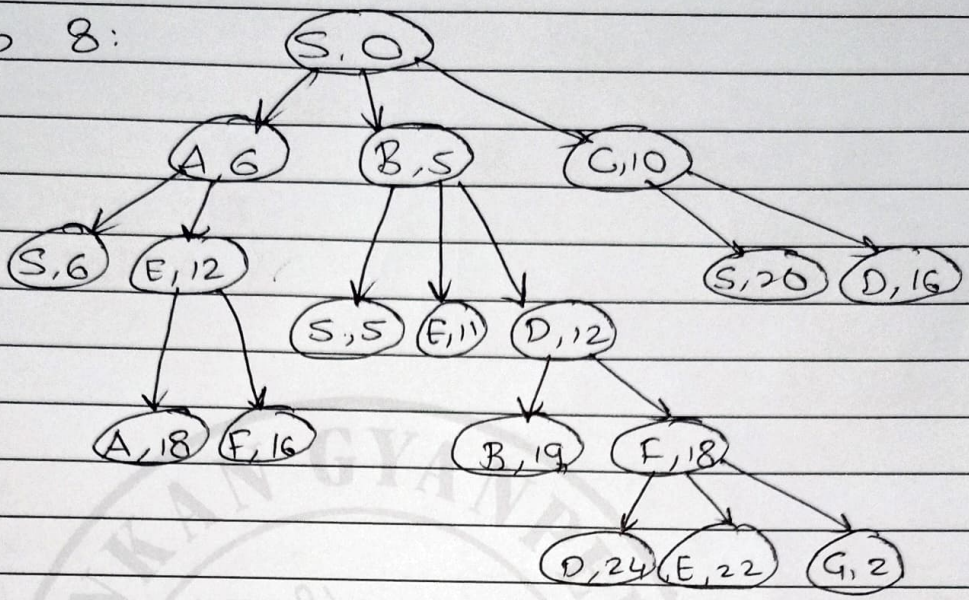
Step 6:



Step 7:



Step 8:



1.4

→ Initialization : Compute f-sure for S & put it in the open list

f-sure S : F(S) = h(S) = 17 (S 17)

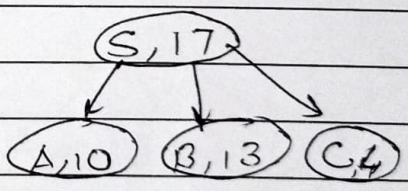
Step 1 :

f-score of successors

F(A) = h(A) = 10

F(B) = h(B) = 13

F(C) = h(C) = 4

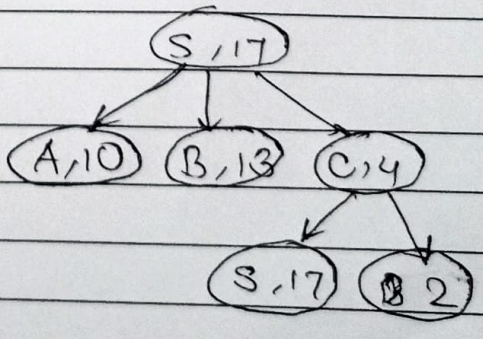


Step 2 :

f-sure of successors

f(S) = h(S) = 17

f(G) = h(G) = 2.



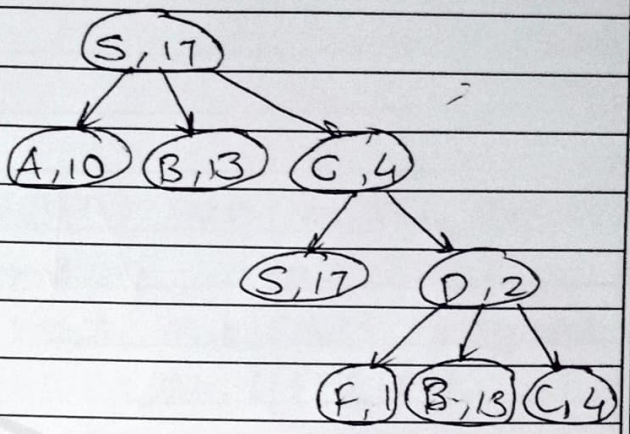
Step 3 :

f - sum - of successor

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

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

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



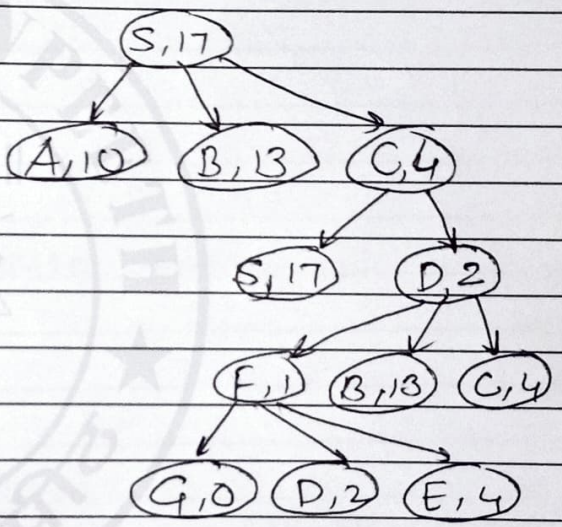
Step 4 :

f - sum of successor

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

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

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



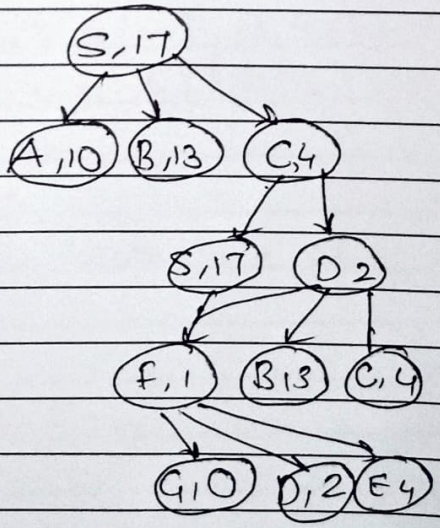
Steps

solution in -

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

solution cost : $10 + 6 + 6 + 3$

$= 25$



Q2

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

Solution can be represented as
{{8,7,6}{2,1,5}{-,3,4}} → {{8,7,6}{2,1,5},{3,-,4}} →
{{8,7,6}{2,1,5}{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]

→

8 7 6 Initial config
2 1 5
3 4 -

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

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

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

e] for i=1 n = initial state

h I (initial) = Misplaced tiles count except space

h i (initial) = 4

n = goal state

h i (goal) = 0

for $i = 2$, n = initial state

h_2 (initial) = correctly replaced files 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 distance between current & correct position of all files except space

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

= 4

For n = goal state

h_3 (goal) = 0.