Assignment NO:- 1A

Name:- Deven. D. Parab

Rol NO:- 44

Batch:- J2

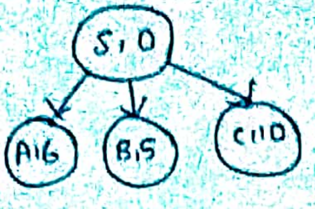
Subject:- A.I

DOA	DOP	Remark	Sign

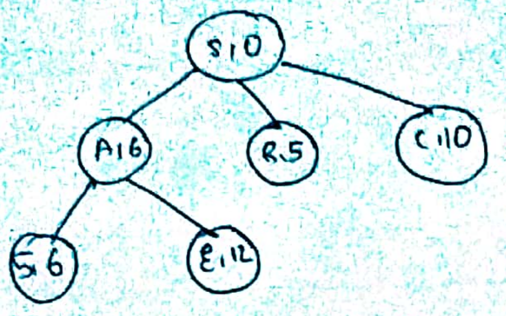
Q:1)

1.1] →

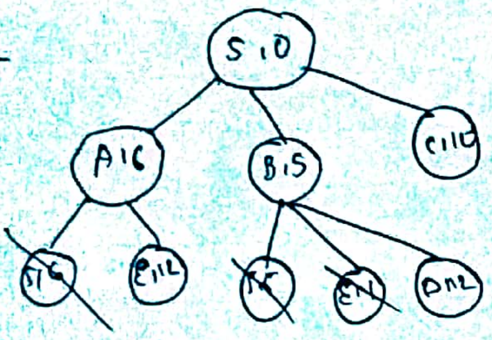
step 1:-



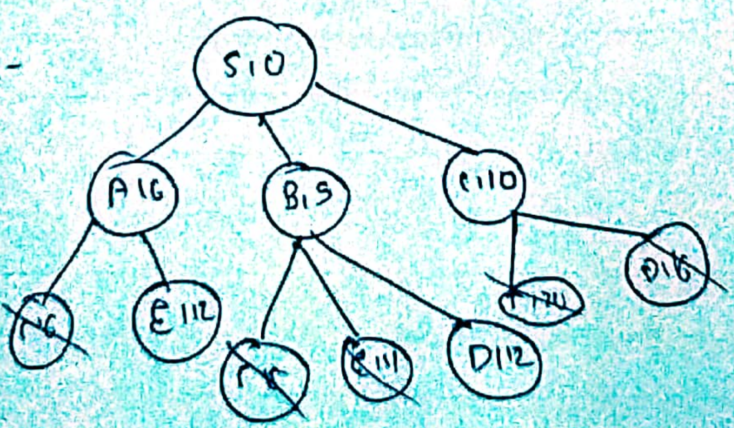
step 2:-



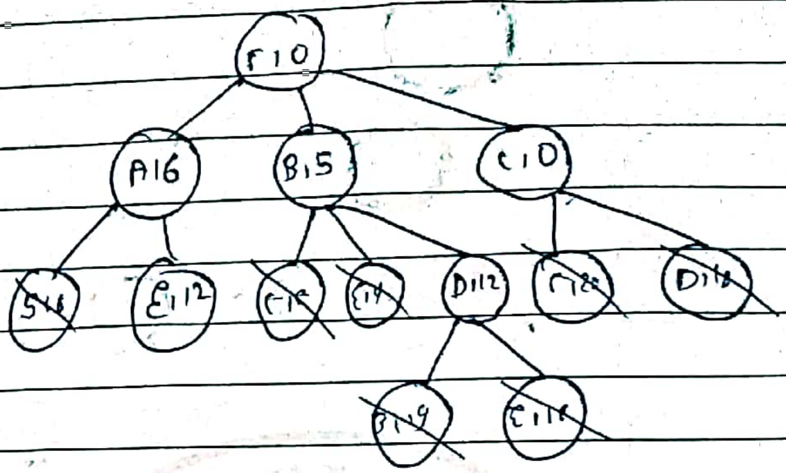
step 3:-



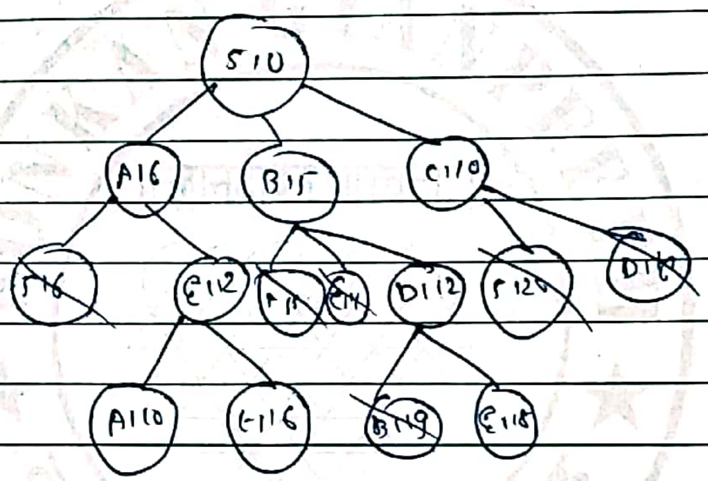
step 4:-



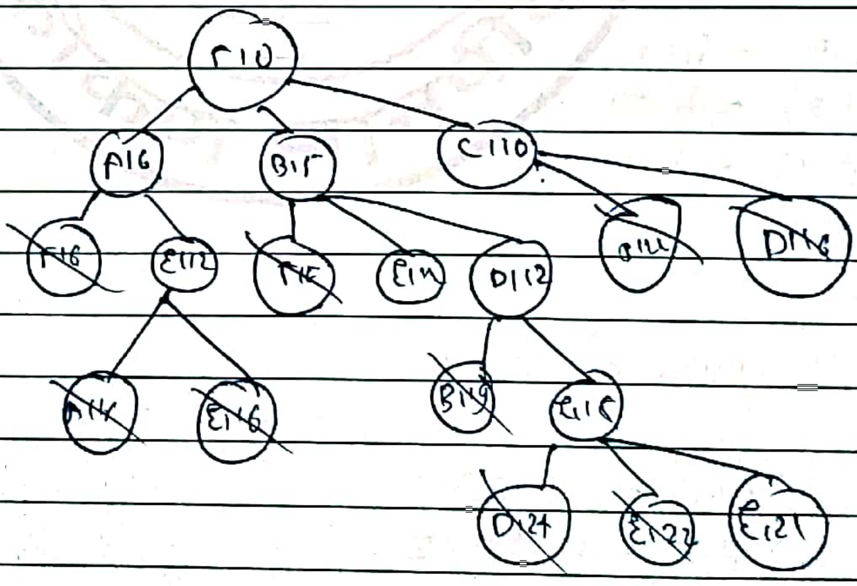
step 5 :-



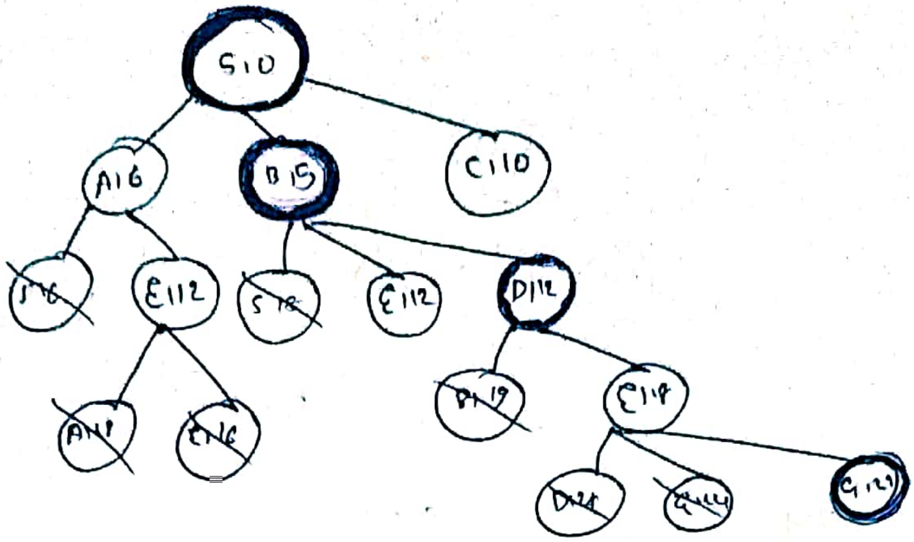
step 6 :-



step 7 :-



Step 8 :-



Q1'4) Initialization :- compute source for S and put it in the openlist.

F-score S :- $f(S) = f(S) = 17$

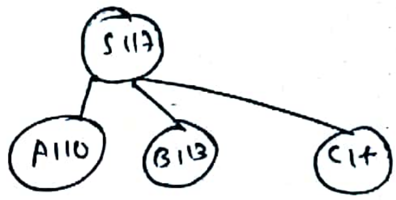
Step 1 :-

f - score of successors

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

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

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

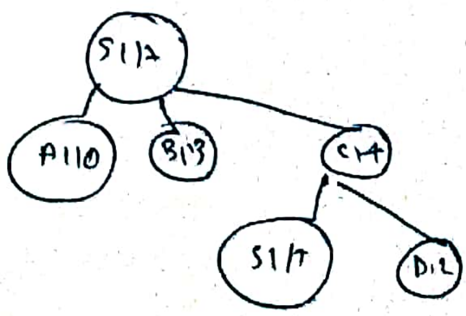


Step 2 :-

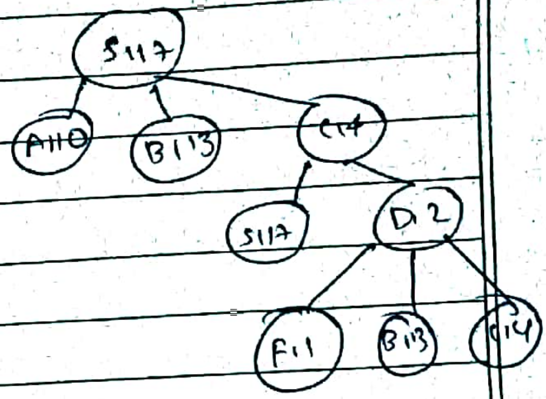
F-score of successors

$f(S) = h(S) = 7$

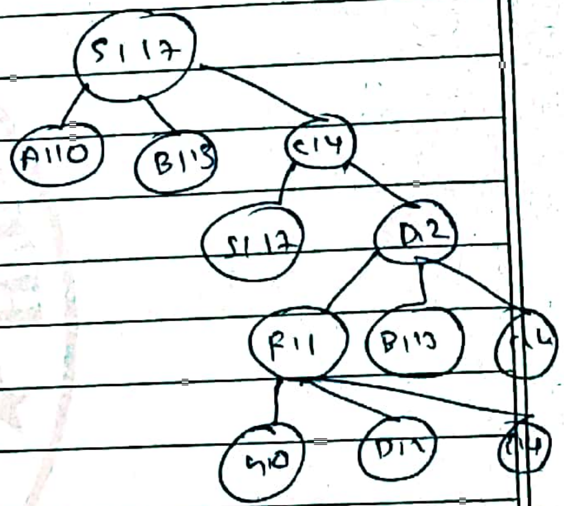
$f(D) = h(D) = 2$



Scanned with CamScanner



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) = 2
f(E) = h(E) = 2
f(G) = h(G) = 0

step 5 :-

solution is :-
S → C → D → F → G with
solution :- 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 these are equally costly, we compute g(n) as

$$g(n) = 1+1+1+1.$$
$$g(n) = 4.$$

consider the following 8 puzzle instances:-

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 we cost would be

$$g(n) = 6.$$

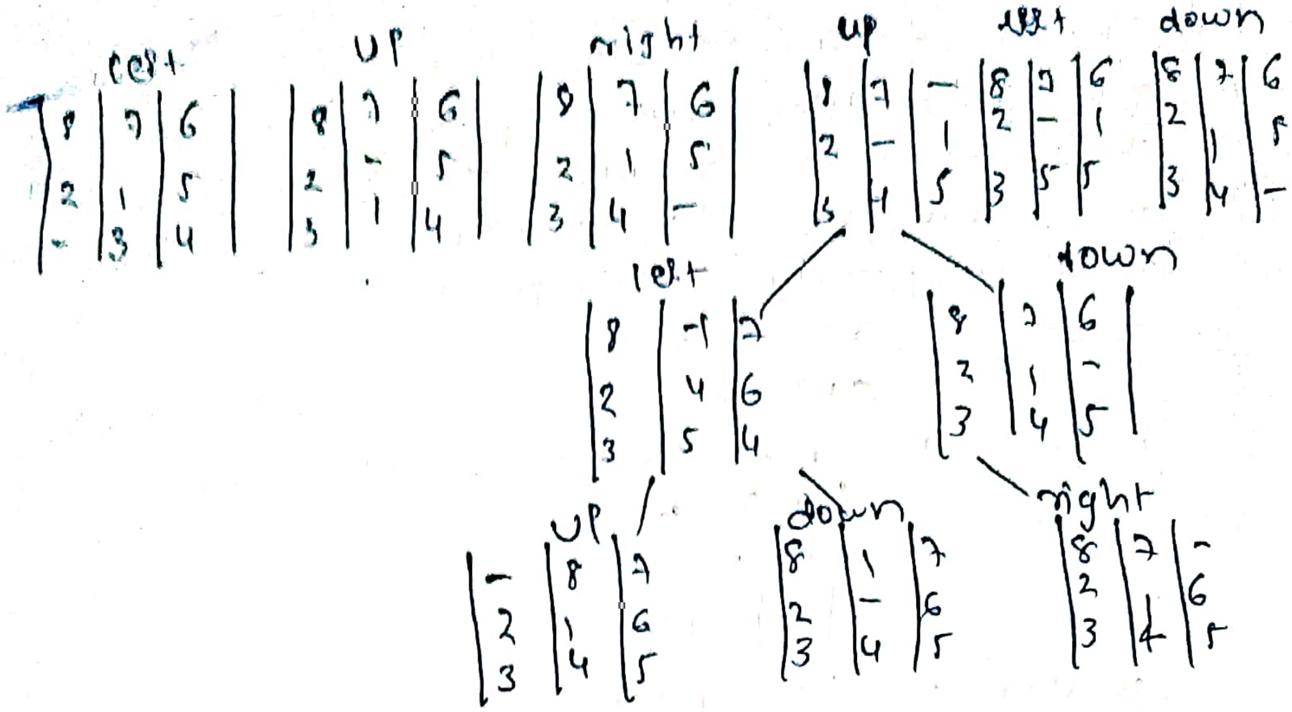
c]

8	7	6
2	1	5
3	4	-

Initial config.

8	7	6
2	1	5
3	-	4

8	7	6
2	1	-
4	4	5



→ For $i=1$, n = initial state

h_1(initial) = misplaced this count except space

h_1(initial) = 4

n = goal state

h_1(goal) = 0

For $i=2$, n = initial state

h_1(initial) = directly spload bits 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 manhattamd id letter current and correct position 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.

Scanned with CamScanner