

Name: ~~Ruty~~ Rutuja Kamalakar Sawant.

class: BE-ZT

ROLL NO: 57

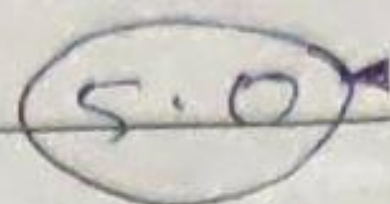
Subject: IS - Lab.

D.O.P.	D.O.S.	Remark	Sign.
--------	--------	--------	-------

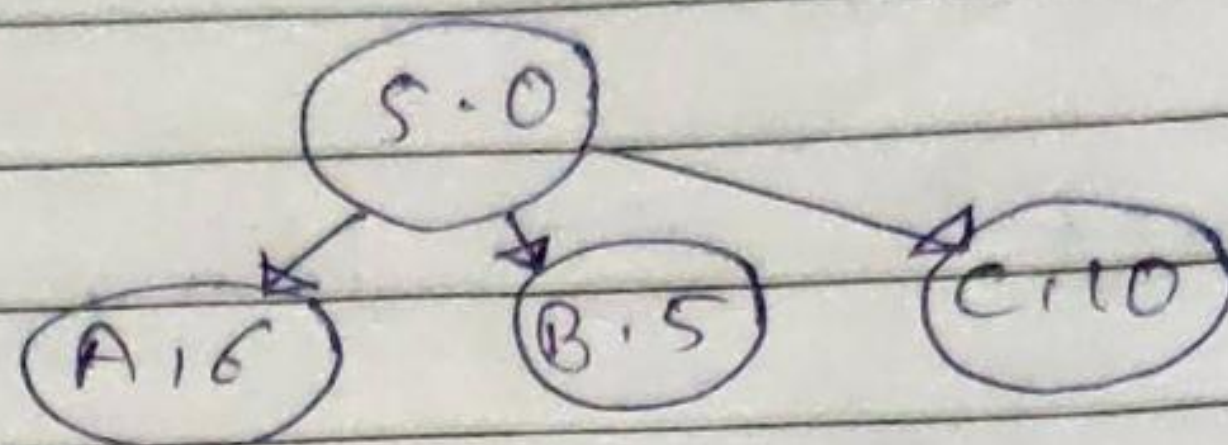
Assignment - 7 (A)

9.1]

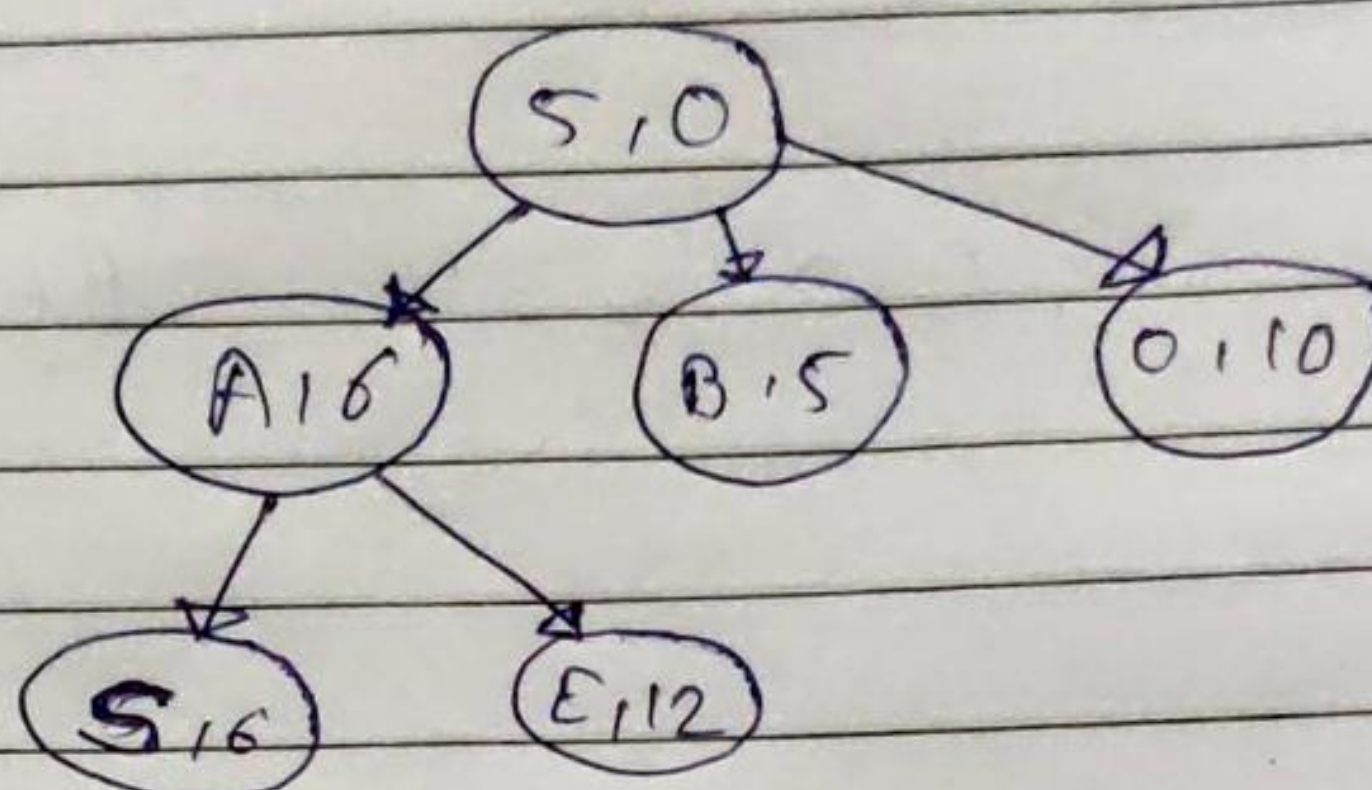
1.1] Step 0:



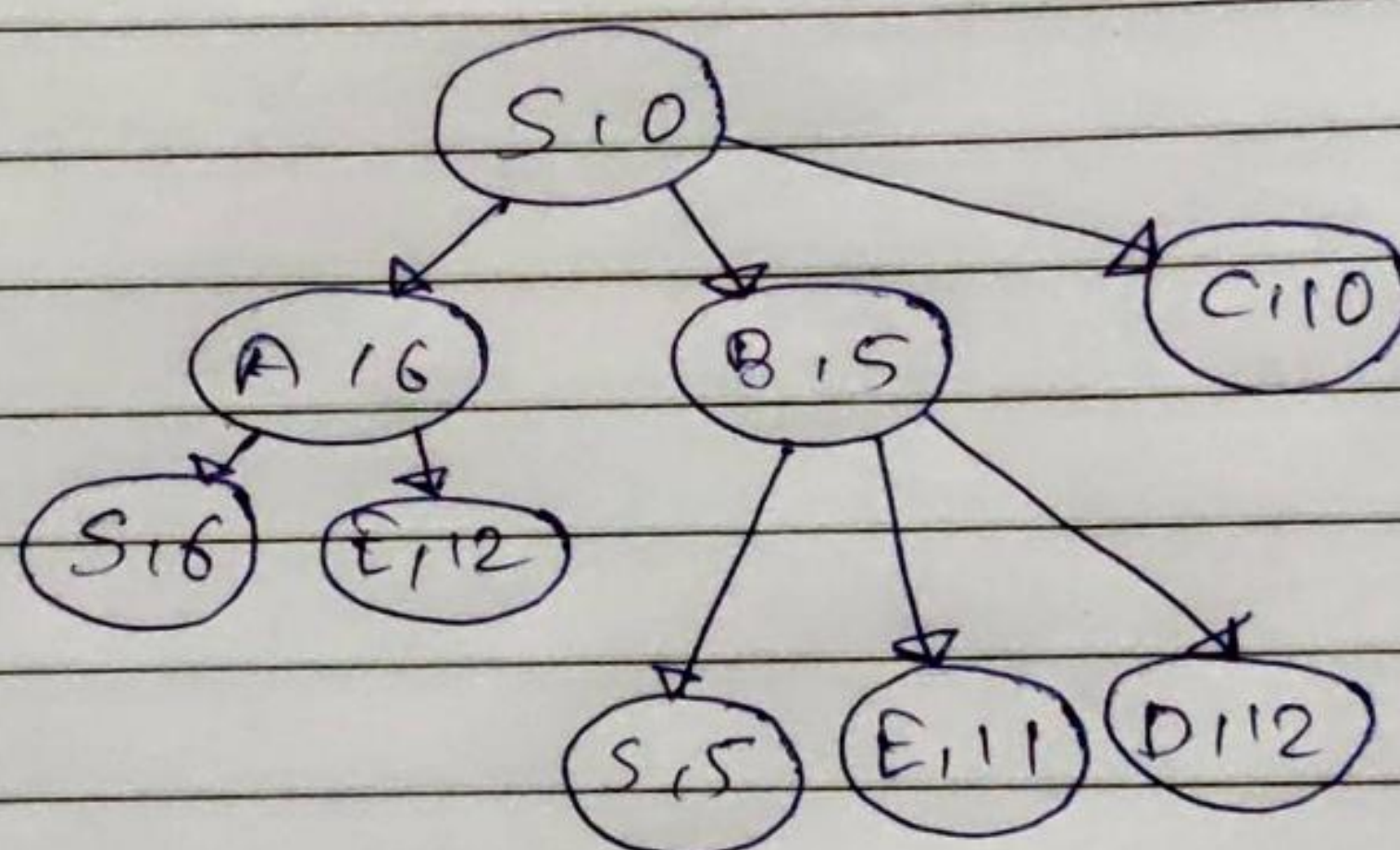
Step 1:



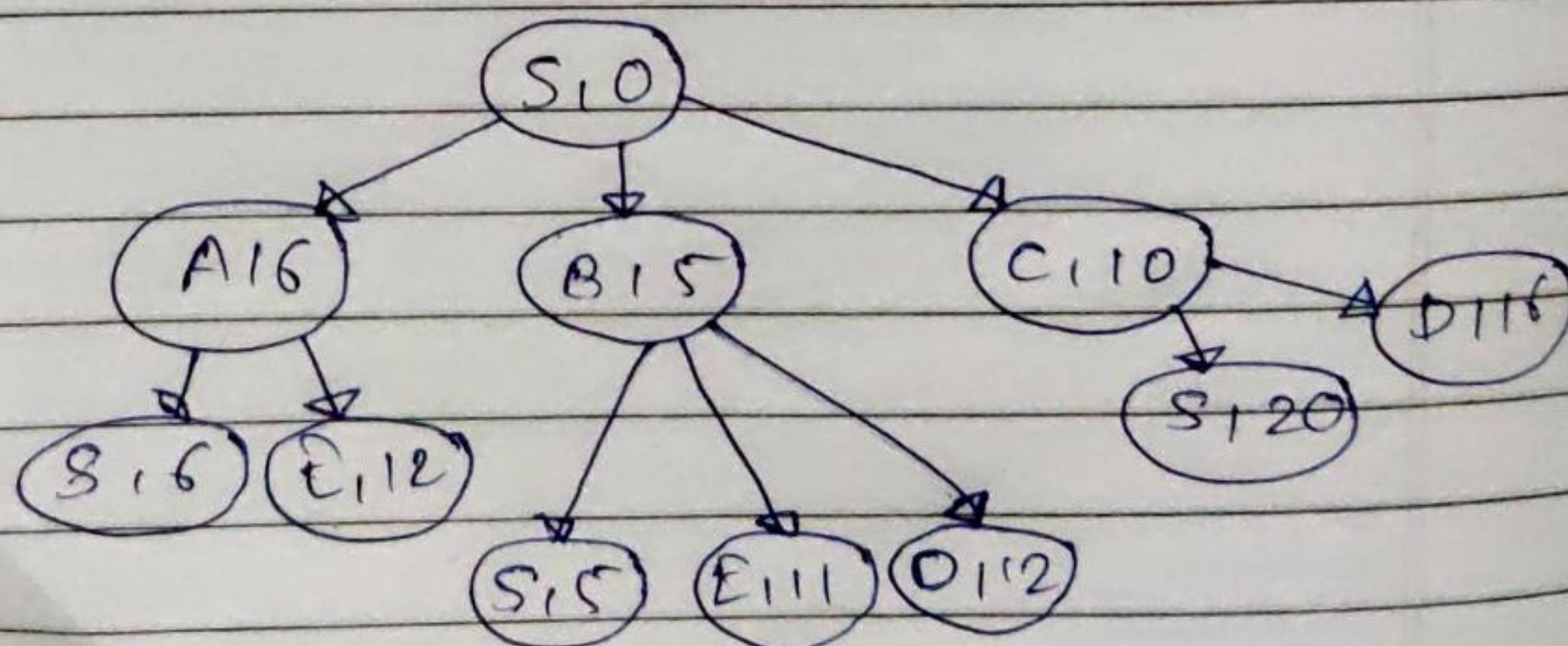
Step 2:



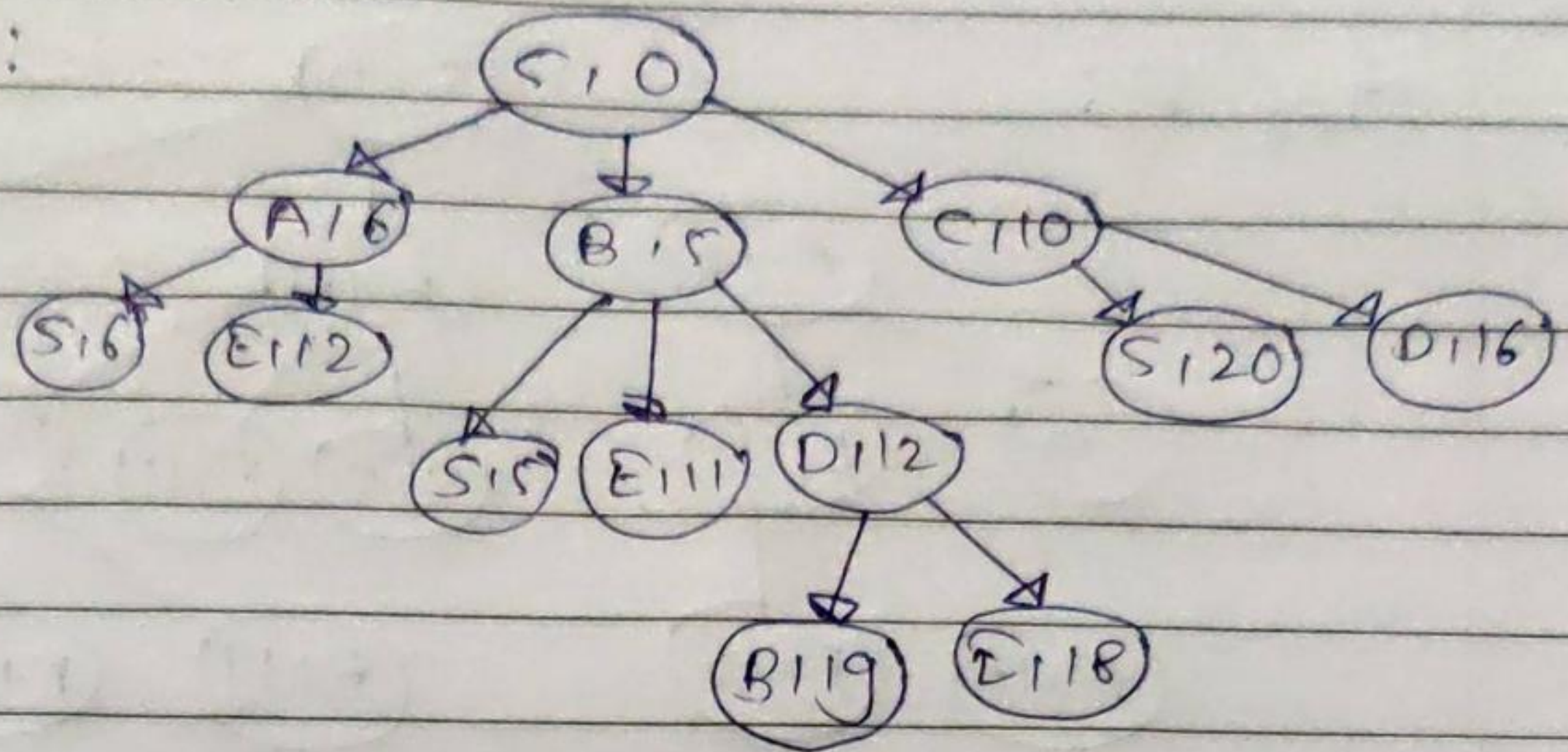
Step 3:



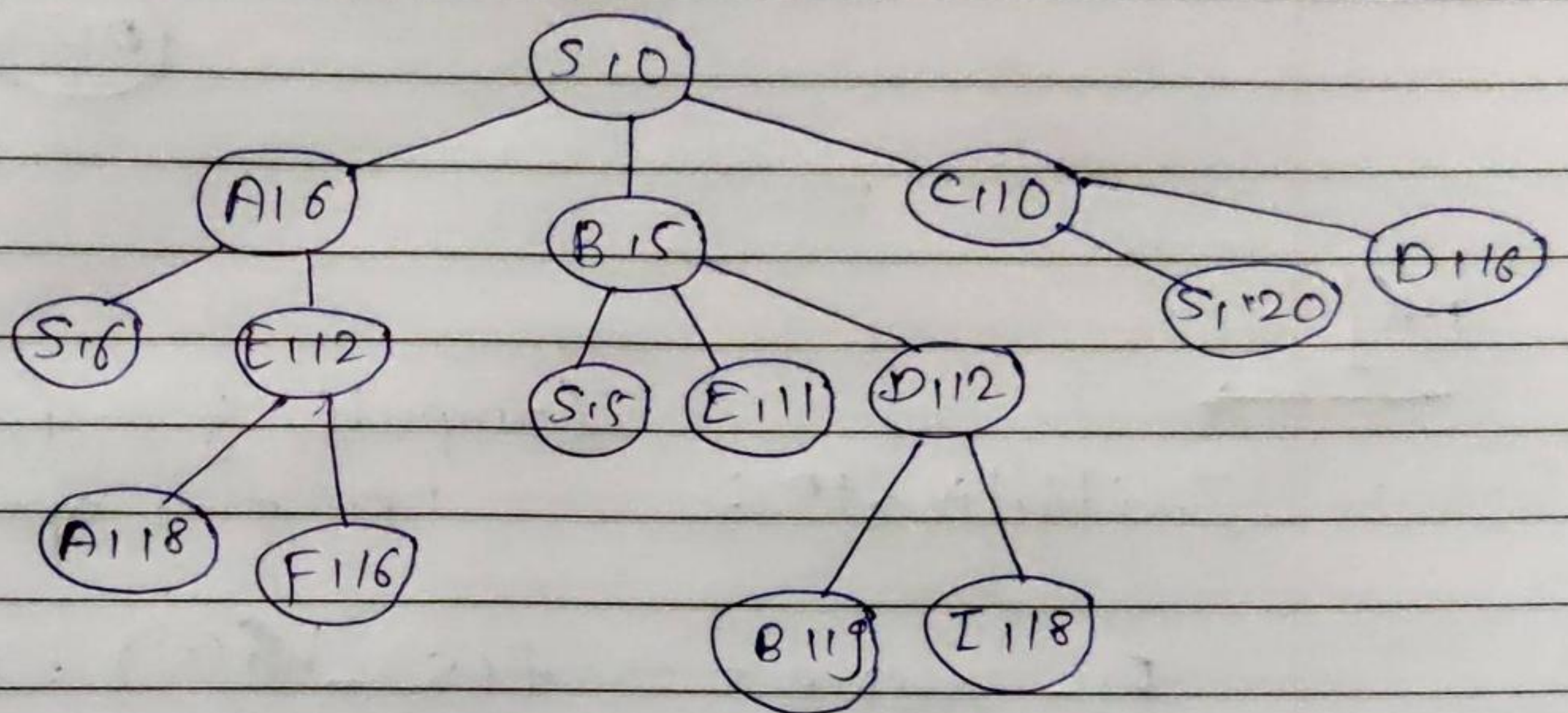
Step 4:



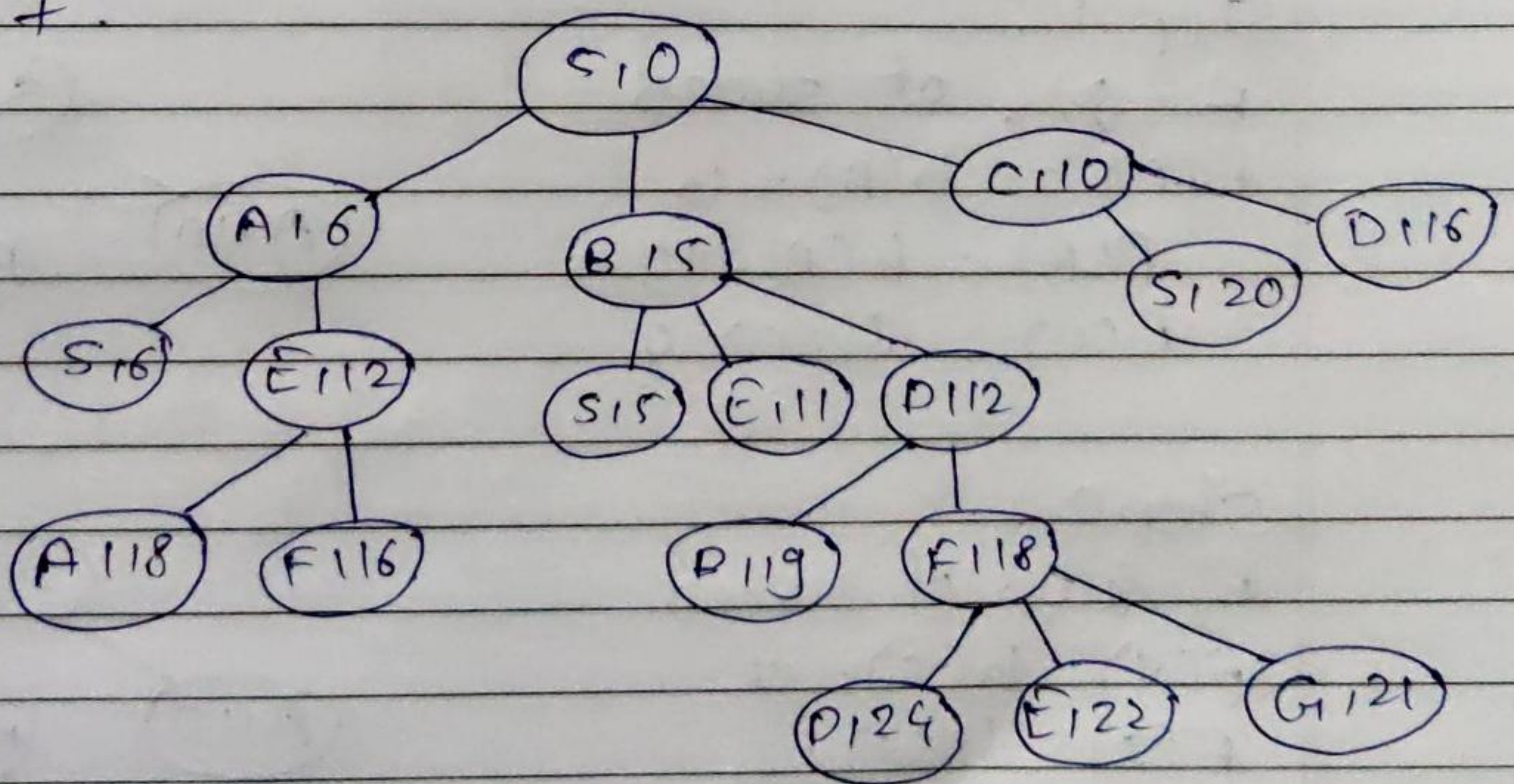
Step 5 :



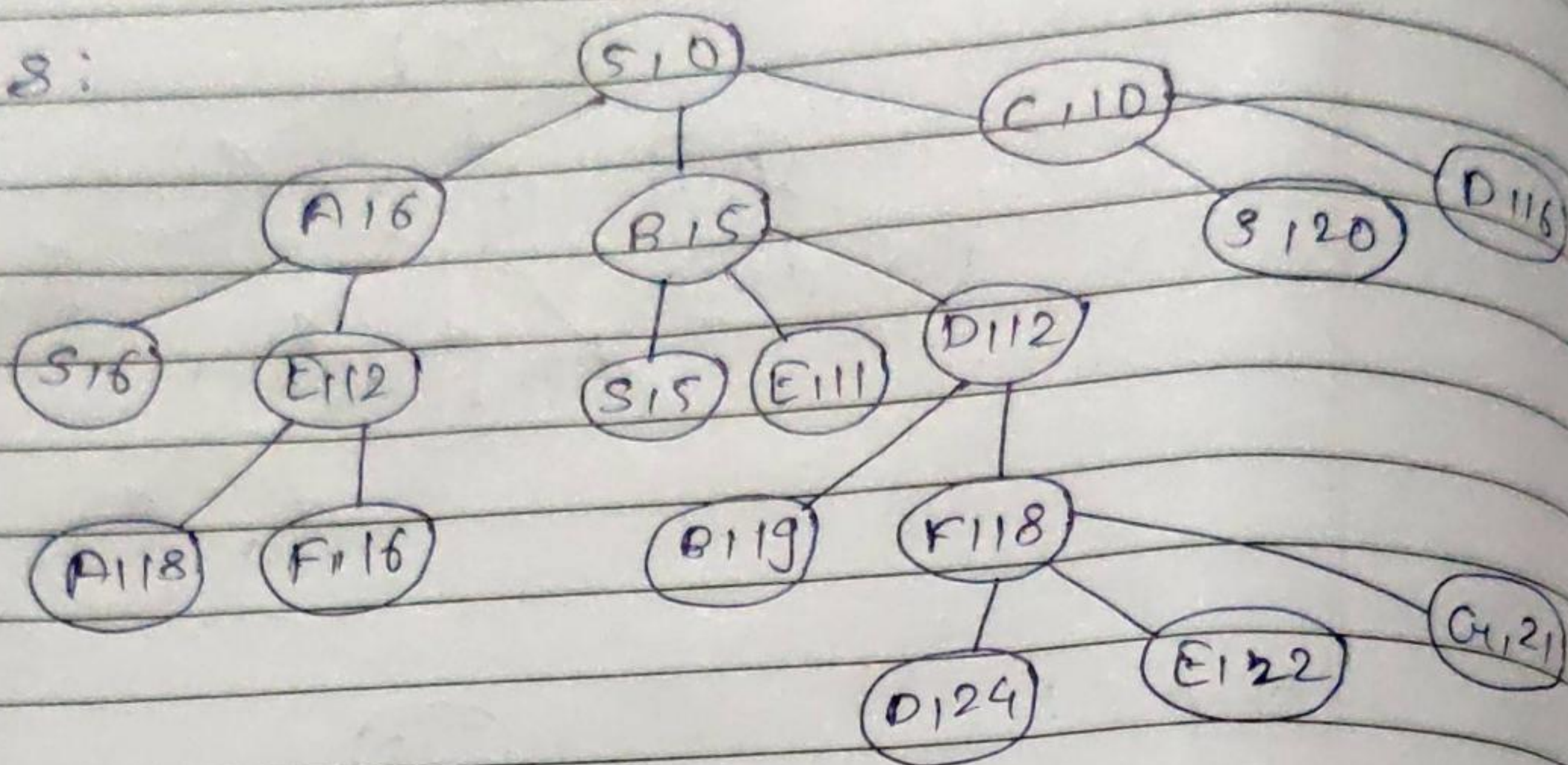
Step 6 :



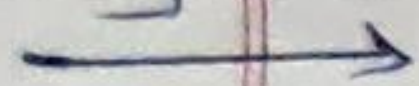
Step 7 :



Step 8:



1.4]



Initialization:

Compute g for s & put it in the openlist.

$$F - \text{value } s = f(s) - h(s) = 17$$

S117

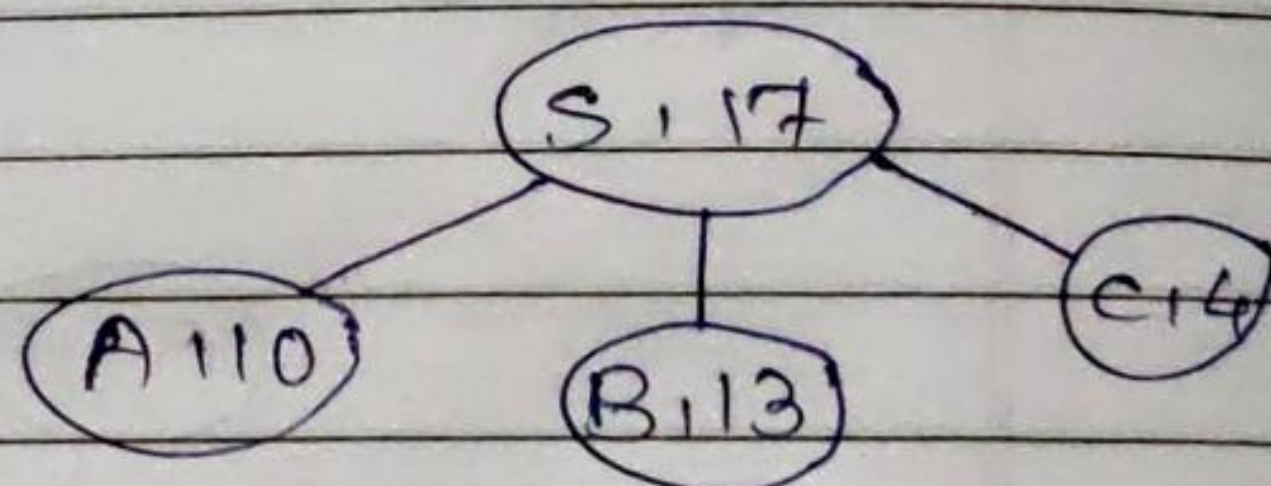
Step 1:

F & g of success

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

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

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

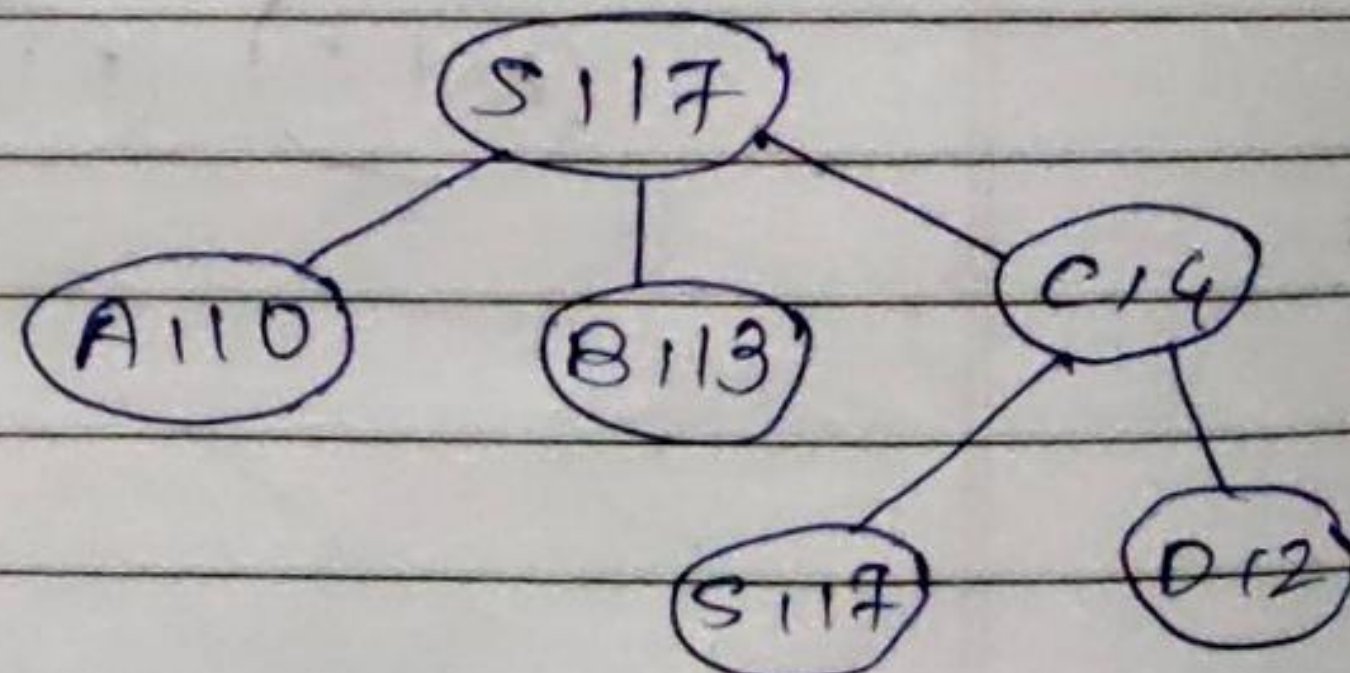


Step 2:

F & g of success

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

$$f(O) = h(O) = 20$$



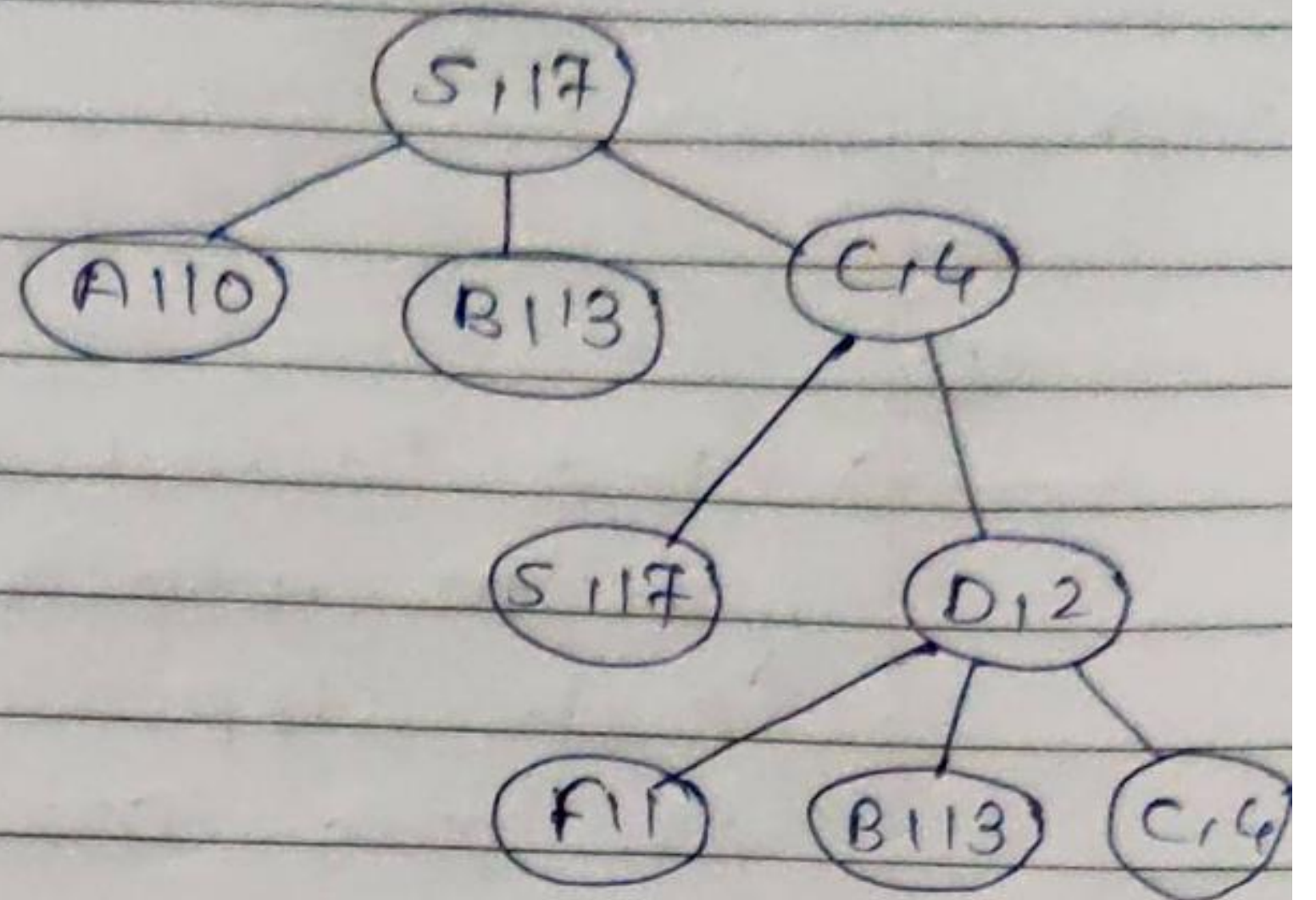
Step 3:

f - sum of success

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

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

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



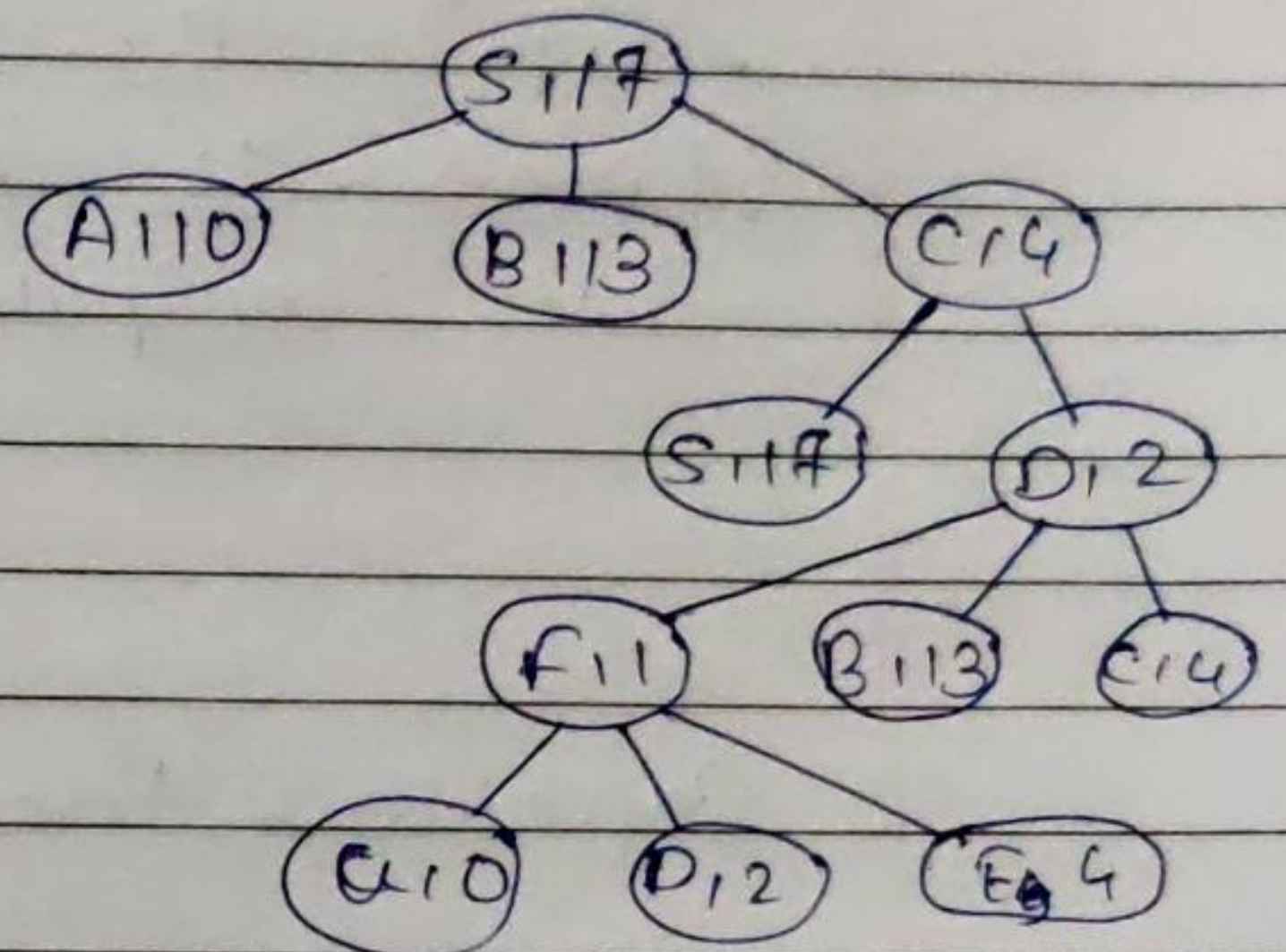
Step 4:

f - sum of success

$$f(A) = h(A) = 2$$

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

$$f(H) = h(H) = 0$$

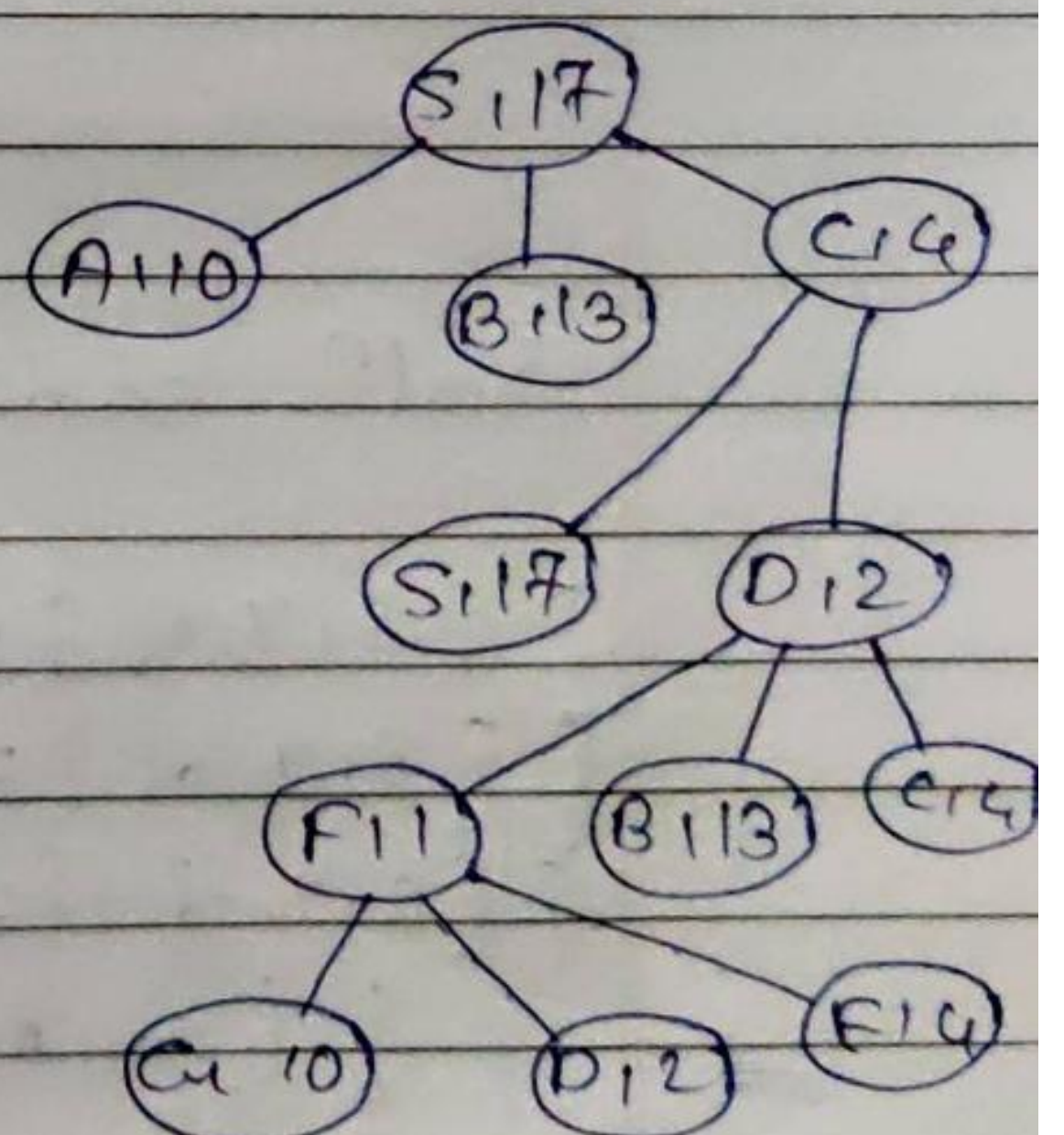


Step 5:

~~Soln~~ solution is -

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

$$\text{Soln cost} = 10 + 6 + 6 + 3 = 25$$



p. 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 $g(n) = 4$.

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

$$g(n) = 4.$$

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

$$g(n) = 6.$$

5. path2: No. of actⁿ to reach the working cell.

∴ path cost = 8 directⁿ + 4 staircase
= 12

g →

8	7	6
2	1	5
3	4	-

Initial config

left

up

8	7	6
2	1	5
3	-	4

8	7	6
2	1	-
3	4	5

left

up

right

up

left

down

8	7	6
2	1	5
-	3	4

8	7	6
2	-	5
3	1	4

8	7	6
2	1	5
3	4	-

8	7	-
2	-	1
3	4	5

8	7	6
2	-	1
3	4	5

8	7	6
2	1	5
3	4	-

left

down

8	-	7
2	1	6
3	4	5

8	7	6
2	1	-
3	4	5

left

down

right

-	8	7
2	1	6
3	4	5

8	1	7
2	-	6
3	4	5

8	7	-
2	1	6
3	4	5

final config

e] →

for $i=1$, $n = \text{initial state}$.

$h_1(\text{initial}) = \text{misplaced tiles count except space}$

$$h_1(\text{initial}) = 4$$

$n = \text{goal state}$

$$h_1(\text{goal}) = 0$$

for $i=2$, $n = \text{initial state}$

$h_2(\text{initial}) = \text{usually replaced tiles count except space}$

$$h_2(\text{initial}) = 4$$

for $n = \text{goal state}$

$$h_2(\text{goal}) = 8$$

for $i=3$, $n = \text{initial state}$

$h_3(\text{initial}) = \text{sum of manhattan dist bet}^n$
current & correct positⁿ of
all tiles count space.

$$h_3(\text{initial}) = 0 + 0 + 0 + 0 + 1 + 1 + 1 + 1$$

$$= 4$$

for $n = \text{goal state}$

$$h_3(\text{goal}) = 0$$