

Name :- Anket Anil Upal

Class :- B.E I T-T

Roll No. :- 72

Subject :- Ts Lab

Q. 1

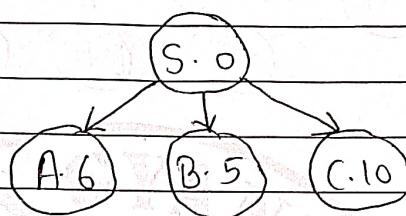
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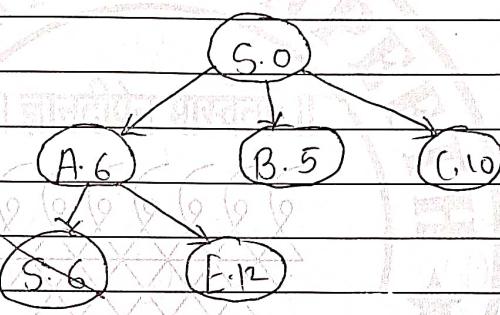
Step 0 :-



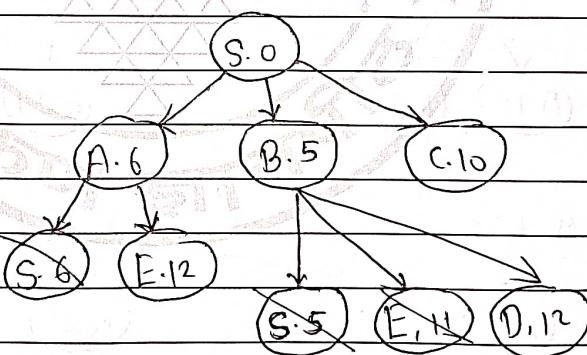
Step 1 :



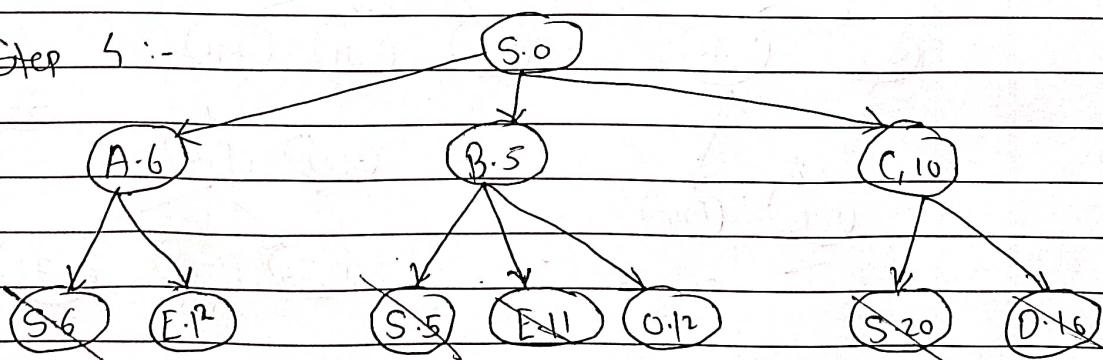
## Step 2

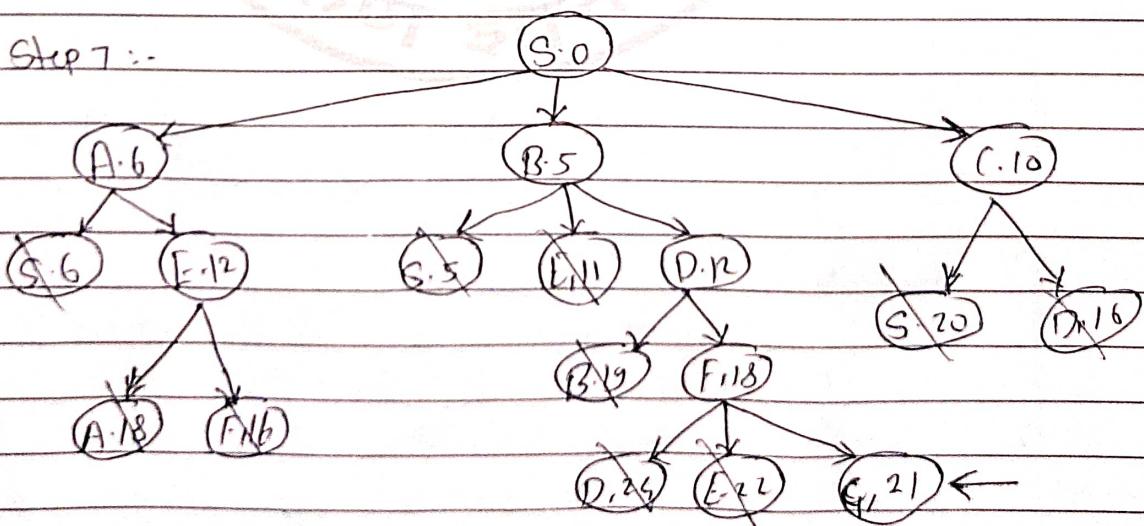
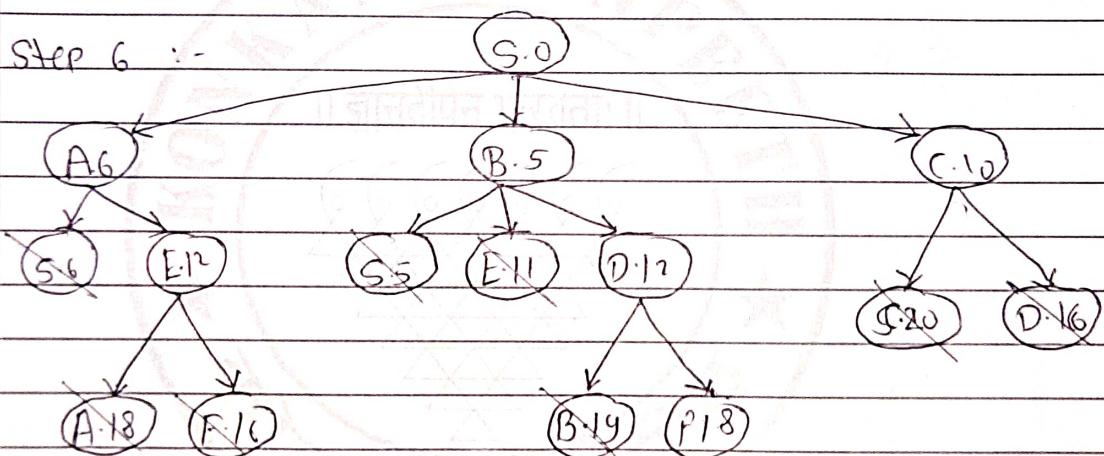
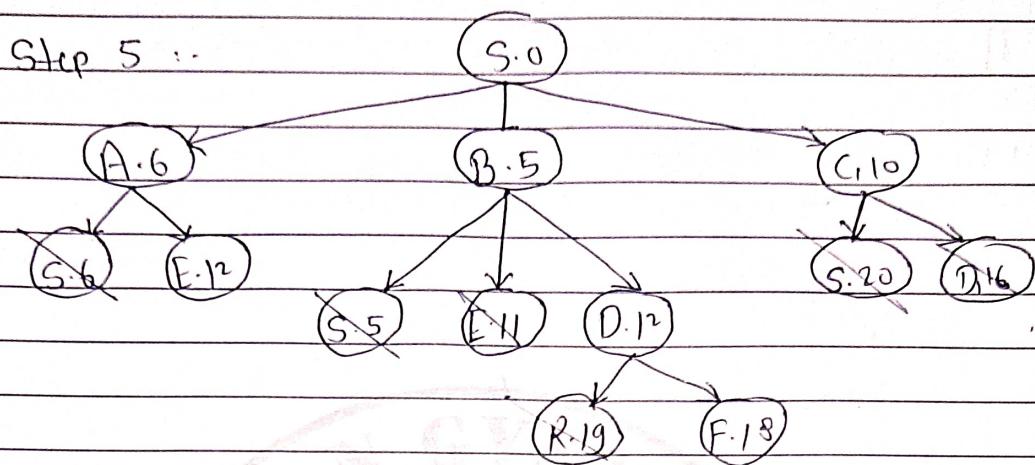


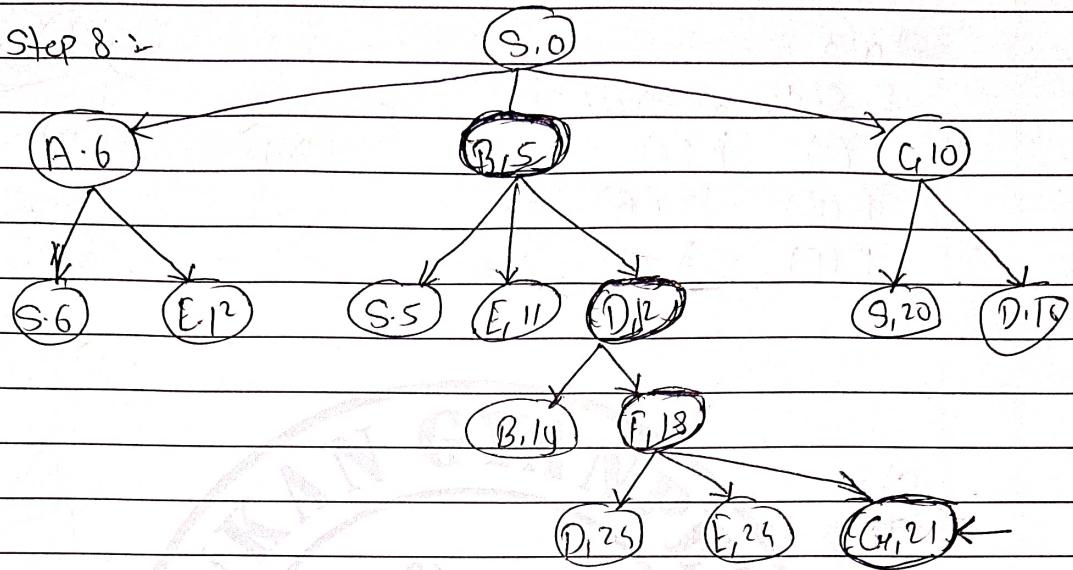
### Step 3 :-



~~Step 5~~ :-







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$\Rightarrow$  Initialization :- Compute F-source for S & Put it in openlist

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

S.17

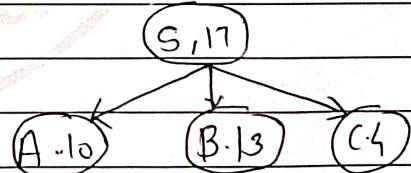
Step 1:

## F - Scale of Success

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

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

$$f(c) = h(c) = 4$$

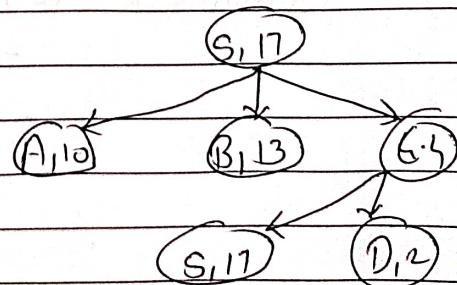


Step 3 :-

## P. Scale of Success

$$F(s) = h(s) \Rightarrow 17$$

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



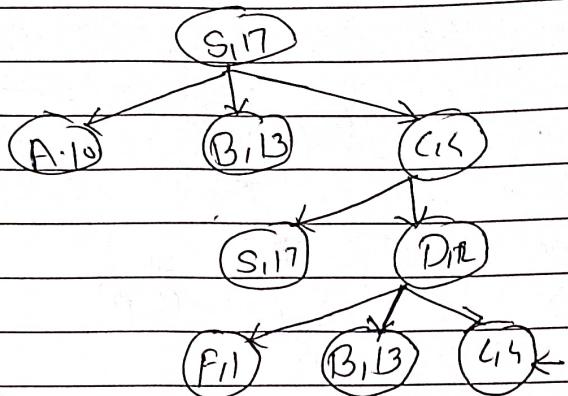
Step 3 :-

## F. Scale of Success

$$F(c) = h(c) =$$

$$F(\beta) = h(\beta) = 13$$

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



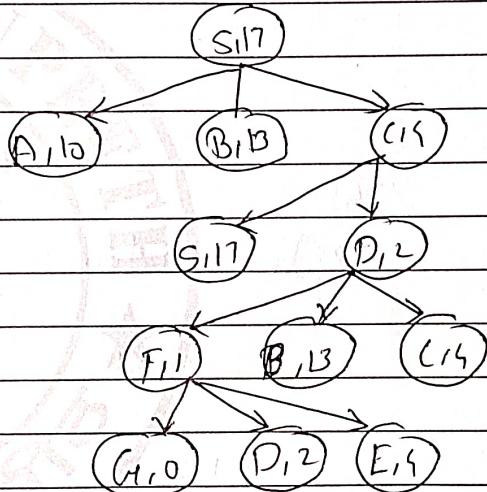
Step 4 :-

## P-Scale of Sales

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

$$P(E) = h(E) = 5$$

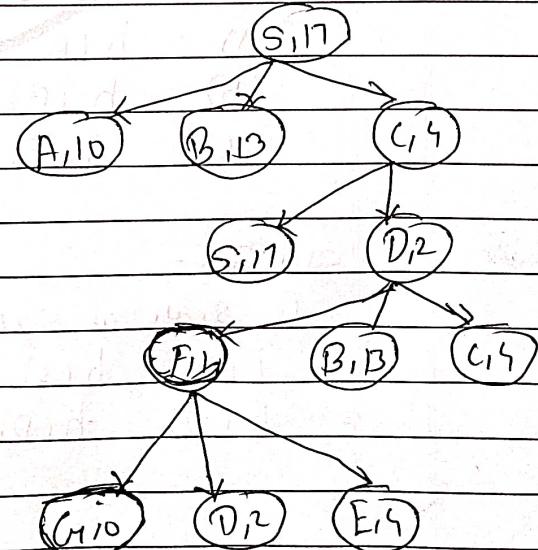
$$P(G) \rightarrow h(G) = 0$$



## Step 5 :-

Solution is

$S \rightarrow C \rightarrow D \rightarrow F \rightarrow G_1$  with



Q. 2

a)  $\Rightarrow$  The lowest path cost  $g(n)$  can be the cost to reach the goal configuration in least step.

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

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

$$g(n) = \cdot$$

Consider the following 8-puzzle instance:

8	7	6
2	1	5
-	3	4

Solution can be represented as

$$\{ \{ 8, 7, 6 \}, \{ 2, 1, 5 \}, \{ -3, 4 \} \} \rightarrow \{ \{ 8, 7, 6 \}, \{ 2, 1, 5 \}, \{ 3, -1, 4 \} \}$$

$$\{ \{8, 7, 6\}, \{2, 1, 5\}, \{3, 4, -1\} \} \rightarrow \{ \{8, 7, 6\}, \{2, 1, -1\}, \{3, 4, 5\} \} \rightarrow$$

$$\{ \{ 8, 7, -3, \{ 2, 1, 5 \} \}, 3, 4, 5 \} \rightarrow \{ \{ 8, -7 \}, \{ 2, 1, 6 \}, \{ 3, 4, 5 \} \} \rightarrow$$

$$\{ \{ -1, 8, 73 \}, \{ 2, 1, 8 \}, \{ 3, 4, 5 \} \}$$

Since all the moves are equally cost. will be

$$\text{Ex } g(n) = 6$$

c)

8	7	6
2	1	5
3	4	-

## Initial Confs

Left

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

Left

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6

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

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<del>8</del>	<del>7</del>	<del>6</del>	<del>8</del>	<del>-</del>	<del>7</del>	<del>8</del>	<del>7</del>	<del>6</del>
<del>2</del>	<del>1</del>	<del>5</del>	<del>2</del>	<del>1</del>	<del>6</del>	<del>2</del>	<del>1</del>	<del>-</del>
<del>3</del>	<del>4</del>	<del>5</del>	<del>3</del>	<del>4</del>	<del>5</del>	<del>3</del>	<del>4</del>	<del>5</del>

## Lett

Po

h1

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

## Final Configuration

e

$\Rightarrow$  For  $i=1, n = \text{initial state}$

`hi(initial) = Misplaced lines count except space`

h1 (initial) = 5

$$n = 9 \text{ at state}$$

h1 (goal) =

Part i = 2 . initial state

$h_2(\text{initial})$  = exactly replaces file count except space

$$h_2(\text{initial}) = 5$$

For  $n = \text{goal state}$

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

For  $j = 3$ ,  $n = \text{initial state}$

$h_3$  (initial) = sum of manhattan dist between current

and correct position of all files except

## Space

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

$\begin{matrix} 2 & 4 \end{matrix}$

For  $n =$  goal state

$$h(3) h_3(\text{goal}) = 0$$