

TALHA HAMEED

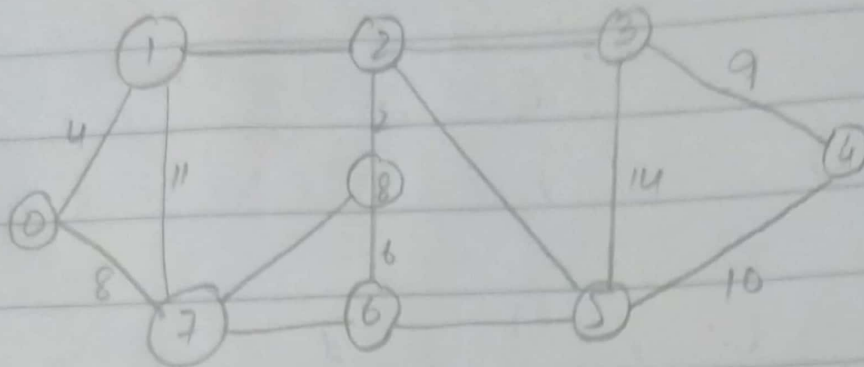
14526

BS (SE)

SECTION (A)

ANSWER NO - (4)

Low input graph



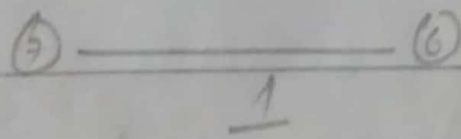
The graph contain 9 vertices and 14-edges, So the minimum spanning tree formed will be having  $(9-1) = 8$  edge

After Sorting

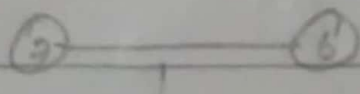
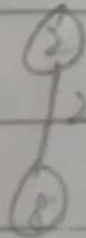
<u>weight</u>	<u>src</u>	<u>Dest</u>
1	7	6
2	8	2
2	6	5
4	0	1
4	2	5
6	8	6
7	2	3
7	7	8
8	0	7
8	1	2
9	3	4
10	5	4
11	1	7

Now pick all edge one by one from sorted list of edge

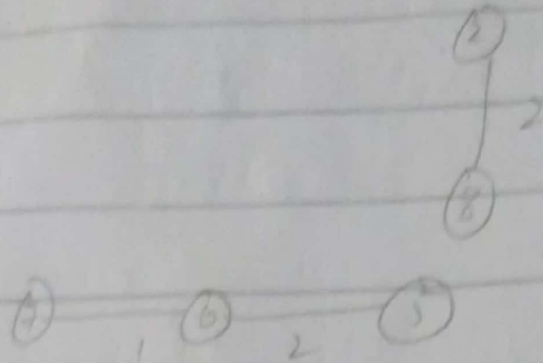
(1) Pick edge 7-6, no cycle is formed include it.



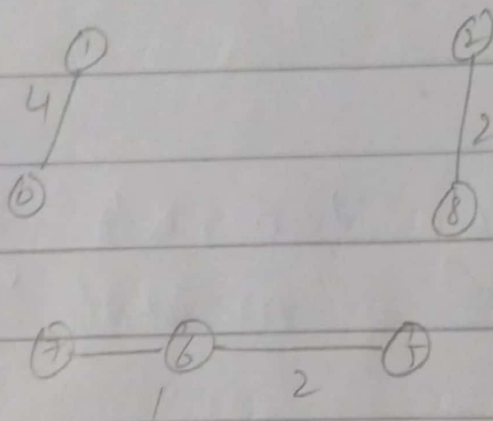
(2) Pick edge - no cycle is formed, include it.



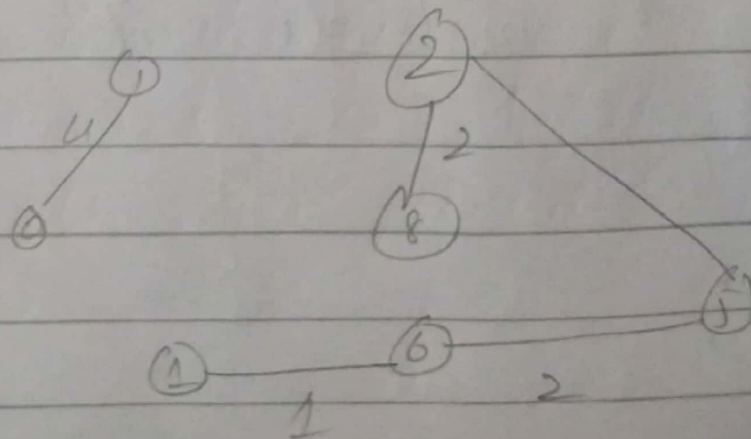
(3) Pick edge 6-5 - no cycle is formed, include it.



(4) Pick edge 0-1 - no cycle is formed, include it.

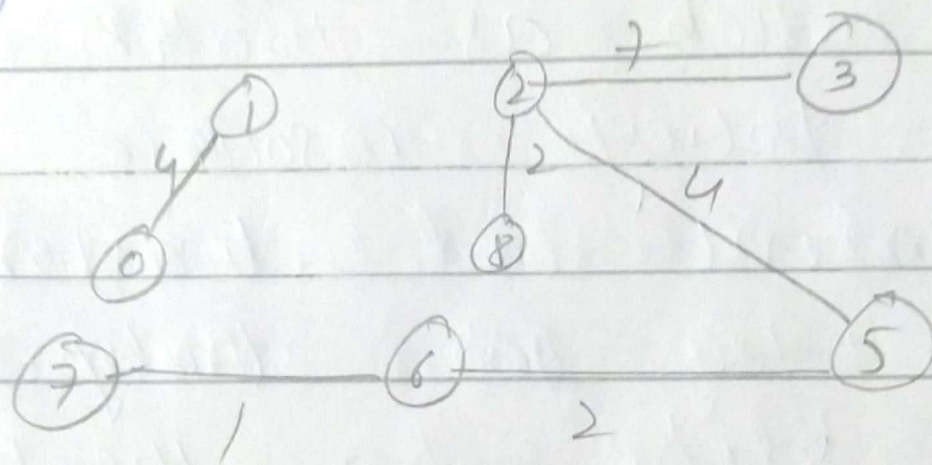


(5) Pick edge 2-5 - no cycle is formed, include it.



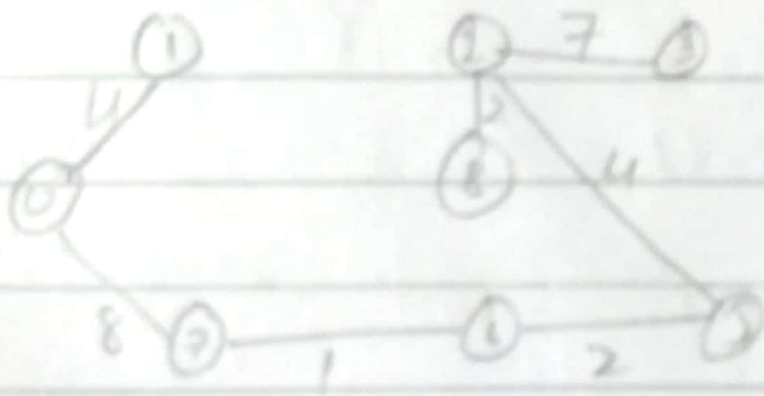
(6) Pick edge 8-6 since including this edge result in cycle, discard it.

(7) Pick edge 2-3 No cycle is formed, include it.



(8) Pick edge 7-8, since including this edge result in cycle discard it.

a) Pick edge  $0-7$  as cycle is formed, include it.



ANSWER No: 5

\* You have the opportunity to solve real-world problems. These problems matter to organizations and have an impact in areas such as health care, public policy, resource management and disaster relief. You can truly change people's lives for the better.

\* You can use your analytical skills and your creativity, whether your background is math, software engineering, computer science or an industry such as health care, manufacturing, finance, government, or military. There is a job in OR for you.

\*) you can make a great living. The starting average salary for an O.R professional is \$60,000 to \$70,000 and it's easy to move up \$100,000 in finance, you can make up to \$300,000 or more.

you are not part of jail  
The diverse technique of O-R including mathematically programming, simulation, decision analysis are all proven with hundred of successful case study. At the same time each, application area is involving so you constantly have to the opportunity to learn new thing.

\* you have have fun at work in many professional careers little of what you create 15



implemented the ability of C.R to have an impact save millions (even hundred of millions) of dollar mean that companies put it solution to use and when you have been part of solution its a great feelings

\* you are extremely relevant today many organization find themselves awash in data with understanding of how to leverage that data for better result with C.R. you bring the science of better tool and approached for harvesting insight from data to make dramatic improvement throuout the organization

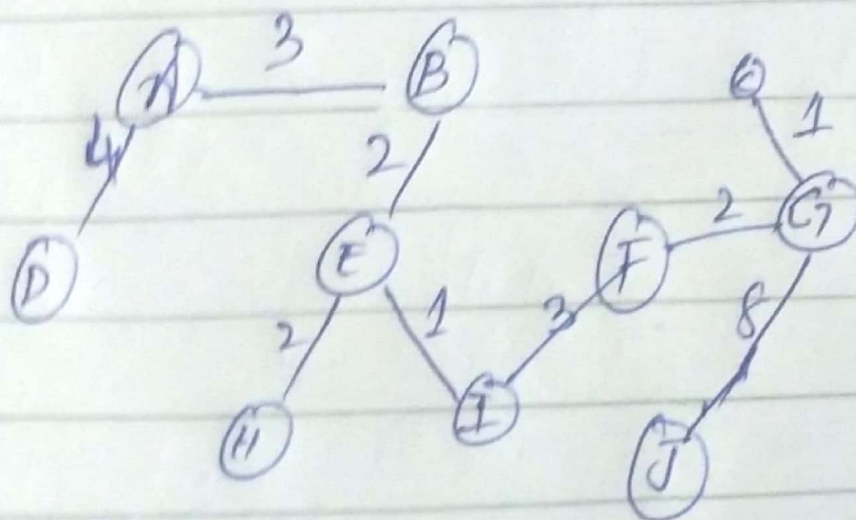
Ques No.:- 3

ANSWER:-

In Prim's Algorithm the idea is simple to create a spanning tree with all sides connected by minimum weight. Also there should be no cycles.

Step 1) Choose an arbitrary start vertex

2) keep including connected edges

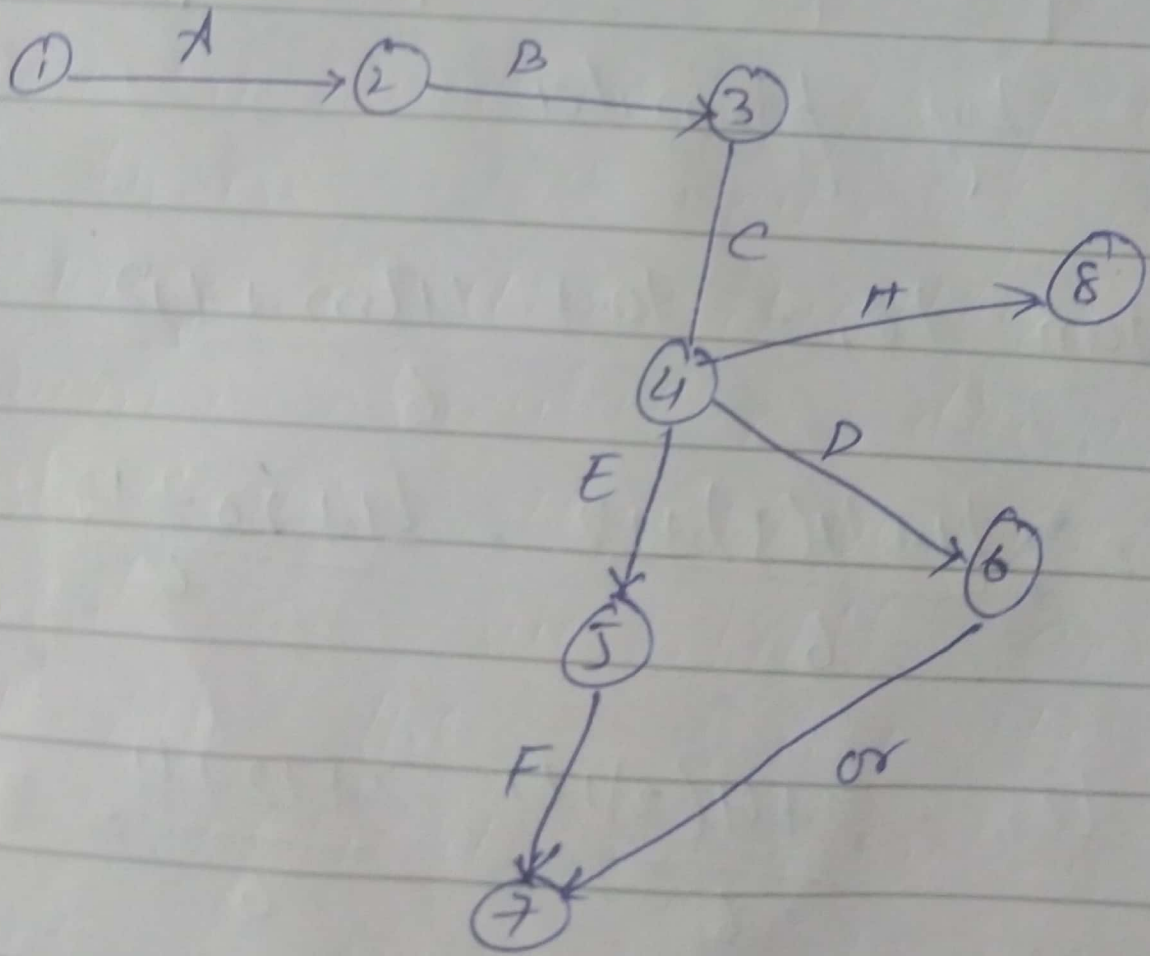


Question No:- 2

ANSWER:-

PART (A)

C. The project network



## PART (b)

Activity	Predecessor	O	M	P	max expected duration	Variance
A		4	5	12	6	1.77
B	A	2	3	4	3	0.11
C	B	6	8	22	10	7.69
D	C	4	6	8	6	0.44
E	C	3	4	5	4	0.11
F	E	2	4	6	4	0.44
G	D, F	2	3	4	3	0.11
H	C	5	7	15	8	2.76

by formula

$$\text{mean } t_e = \frac{t_o + 4t_m + t_p}{6}$$

$$= \frac{4 + 4(5) + 12}{6} = \frac{4 + 20 + 12}{6}$$

$$\Rightarrow t_{e2} = \frac{2 + 4(3) + 4}{6} = \frac{2 + 12 + 4}{6} = 3$$

$$t_{e3} = \frac{6 + 4(8) + 22}{6} = \frac{6 + 32 + 22}{6} = 10$$

$$t_{e4} = \frac{4 + 4(6) + 8}{6} = \frac{4 + 24 + 8}{6} = 6$$

$$t_{e5} = \frac{3 + 4(4) + 5}{6} = \frac{3 + 16 + 5}{6} = 4$$

$$t_{e6} = \frac{2 + 4(4) + 6}{6} = \frac{2 + 16 + 6}{6} = 4$$

$$t_{e7} = \frac{2+4(3)+4}{6} = \frac{2+12+4}{6} = 3$$

$$t_{e8} = \frac{5+4(7)+15}{6} = \frac{5+28+15}{6} = 8$$

Variance ( $\sigma^2$ )

By formula

$$\sigma^2 = \left( \frac{t_p - t_0}{6} \right)^2$$

$$\sigma_1^2 = \left( \frac{12-4}{6} \right)^2 = \left( \frac{8}{6} \right)^2 = (1.33)^2 = 1.77$$

$$\sigma_2^2 = \left( \frac{4-2}{6} \right)^2 = \left( \frac{2}{6} \right)^2 = 0.11$$

$$\sigma_3^2 = \left( \frac{22-6}{6} \right)^2 = \left( \frac{16}{6} \right)^2 = 7.09$$

$$\sigma_4^2 = \left( \frac{8-4}{6} \right)^2 = \left( \frac{4}{6} \right)^2 = 0.44$$

$$\sigma_5^2 = \left( \frac{5-3}{6} \right)^2 = \left( \frac{2}{6} \right)^2 = 0.11$$

$$\sigma_6^2 = \left( \frac{6-2}{6} \right)^2 = \left( \frac{4}{6} \right)^2 = 0.44$$

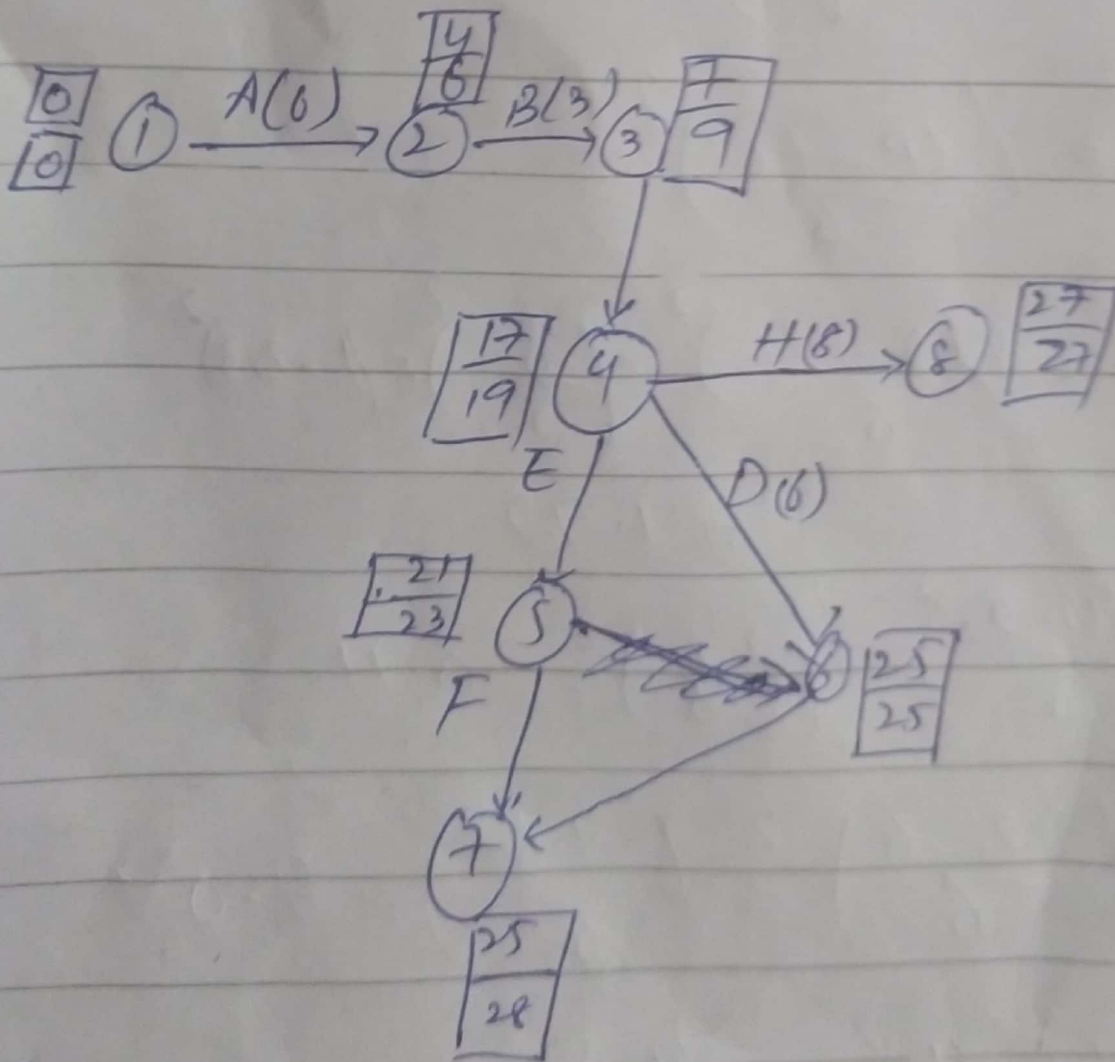
$$\sigma_7^2 = \left( \frac{4-2}{6} \right)^2 = \left( \frac{2}{6} \right)^2 = 0.11$$

(4)

$$\sigma_p^2 = \left(\frac{15-5}{6}\right)^2 = \left(\frac{10}{6}\right)^2 = 2.76$$

## PART C

Find critical path

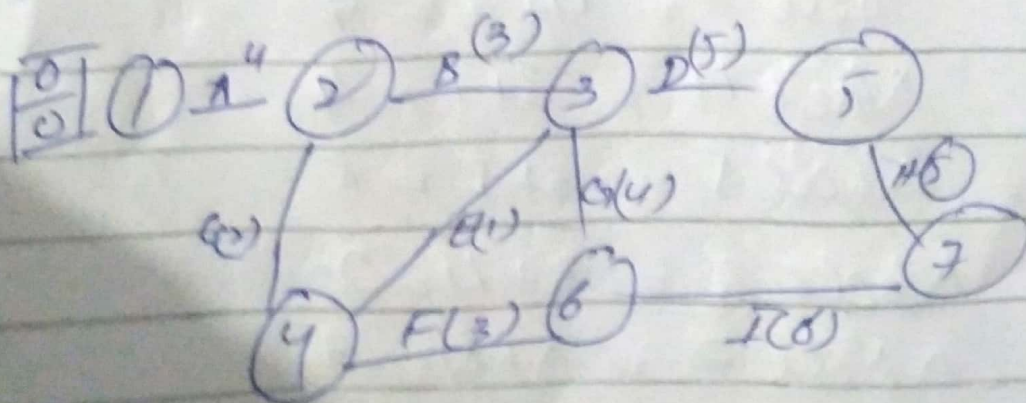


Que NO:- 1

Activity	Predecessors	Time
A	-	4
B	A	3
C	A	2
D	B	5
E	B, C	1
F	C	3
G	E, F	4
H	D, E	4
I	H, G	6

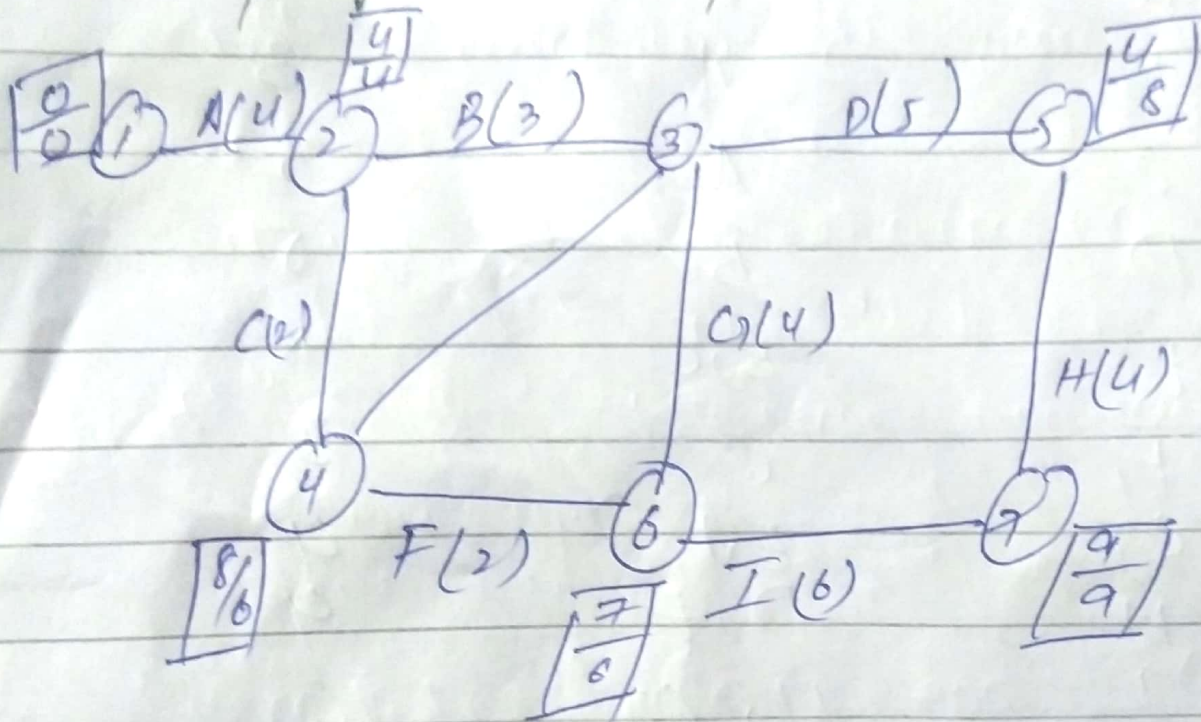
ANS:-

(a) the CPM Network



## PART B

The critical path and project completion time



we know that

$$E_{sj} = \max(E_{si} + D_{ij})$$

$$\text{For Node 1} = E_{s1} = 0$$

$$\text{Node 2} = 0 + 4 = 4$$

$$\text{Node 3} = 4 + 3 = 7$$

$$\text{Node 4} = 3 + 1 = 4$$

$$\text{Node 5} = 3 + 5 = 8$$

$$\text{Node 6} = 3 + 4 = 7$$

$$\text{Node 7} = 5 + 4 = 9$$



# PART 1

