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ID	14693
section	(B)
Semester	4 th
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Paper Name	Operations Research
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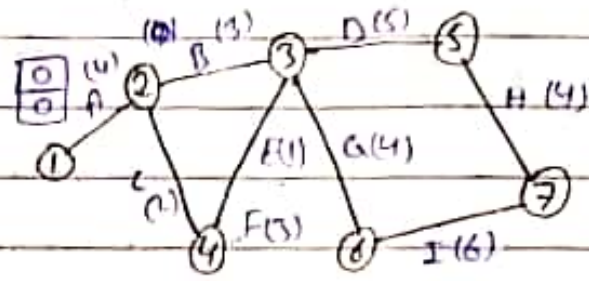
Q

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Q1 Q1 = 1)a

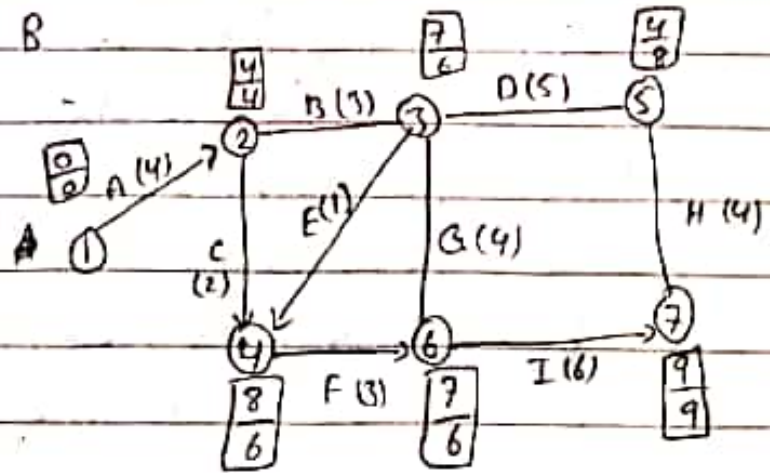
Ans a=1

calculate the CPM Network.



Q1 = b

Q1) B



②

①

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we know that

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

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

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

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

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

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

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

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



Q1 (c)

Q1)(c) for total float we know that

$$TF_i = L_{sj} - E_{si} - D_{ij}$$

Activity	Duration (D _{ij})	Total 2	F.F- float
A 1-2	4	1	1
B 1-3	3	4	5
C 1-4	2	3	3
D 3-4	5	2	2
E 2-5	1	1	1
F 2-6	3	2	1
G 3-6	4	3	2
!	!	!	!
!	!	!	!

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Total Float -

$$L_{ij} = E_{si} - D_{ij}$$

$$\text{For } A = 1 - 2 = 4 - 0 = 4$$

$$B = 2 - 3 = 3 - 1 = 2$$

$$\begin{matrix} 4 \\ (1) \end{matrix} \quad C = 5 - 4 = 1$$

$$D = (5 - 1) = 4$$

$$E = 4 - 1 = 3$$

$$F = 3 - 1 = 2$$

$$G = 3 - 2 = 1$$

$$H = 6 - 4 = 2$$

$$I = 3 - 6 = 3$$

= For Free float.

$$A = 1 - 2 = 1 - 2 = 1$$

$$B = 2 - 3 = -1 - 4 = -5$$

$$C = 3 - 4 = 2 - 8 = 5$$

$$D = 4 - 5 = 4 - 2 = 2$$

$$E = 5 - 6 = 3 - 2 = 1$$

$$F = 6 - 7 = 1 - 2 = 1$$

$$G = 7 - 8 = 2 - 4 = 2$$

$$H = 8 - 9 = 10 - 2 = 8$$

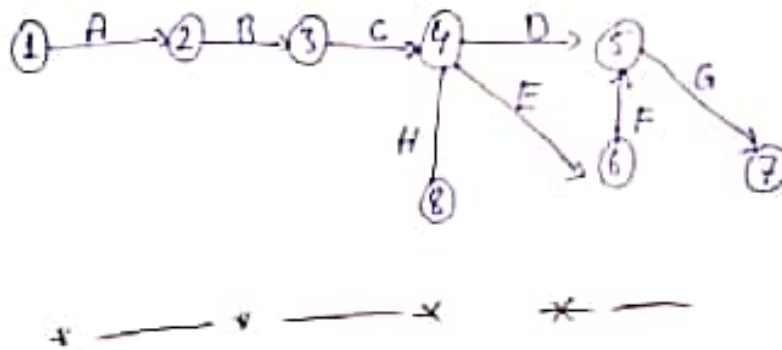
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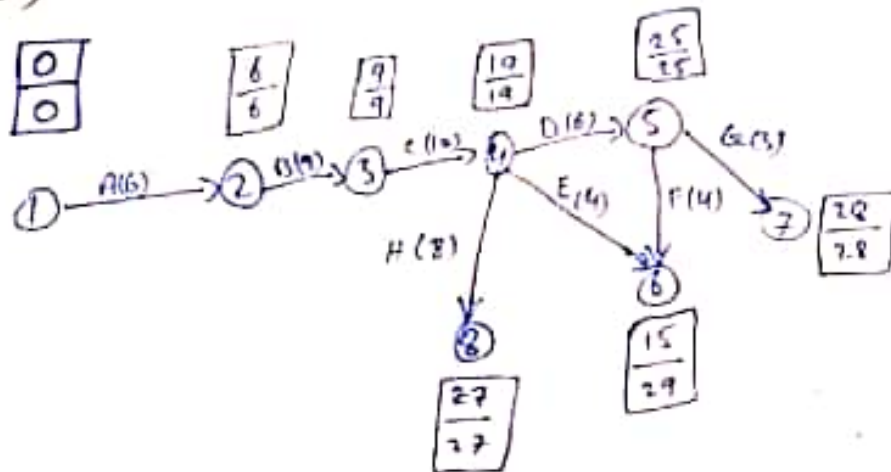
Q 2 = (a)

Ans a) = construct the project network.



Q 2(c)

Ans(c)



completion time = 27

(5)

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Q2. b

Activity	duration			Mean (expected)	Variance
	Q	M	P		
A	4	5	12	6	2.77
B	2	3	4	3	0.11
C	6	8	22	10	7.11
D	4	6	8	6	0.44
E	3	4	5	4	0.11
F	2	4	6	4	0.44
G	2	3	4	3	0.11
H	5	7	15	8	2.77

(Mean) to

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

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

$$= \frac{4 + 20 + 12}{6}$$

$$= \frac{36}{6} = 6$$

$$t_e = \frac{2 + 4(3) + 4}{6}$$

$$= \frac{2 + 12 + 4}{6} = 3$$

$$t_e = \frac{6 + 4(8) + 22}{6}$$

$$= \frac{6 + 32 + 22}{6} = 10$$

(5)

(6)

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$$1e5 = \frac{3+4(4)+5}{6}$$

$$= \frac{3+16+5}{6} = 4$$

$$1e6 = \frac{2+4(4)+6}{6}$$

$$\text{to } \frac{2+16+6}{6} = 4$$

$$1e7 = \frac{2+4(3)+4}{6}$$

$$= \frac{2+12+4}{6} = 3$$

$$1e8 = \frac{5+4(7)+15}{6}$$

$$= \frac{5+28+15}{6} = 8$$

variance (z^2)

$$z^2 = \frac{(10 - 4)^2}{6}$$

$$= z_1^2 = \frac{(11-4)^2}{6} = \left(\frac{7}{6}\right)^2 = (1.166)^2 = 1.37$$

$$= z_2^2 = \frac{(4-2)^2}{6} = \left(\frac{2}{6}\right)^2 = 0.11$$

$$= z_3^2 = \frac{(22-6)^2}{6} = \left(\frac{16}{6}\right)^2 = 7.09$$

$$= z_4^2 = \frac{(8-4)^2}{6} = \left(\frac{4}{6}\right)^2 = 0.44$$

$$= z_5^2 = \frac{(5-2)^2}{6} = \left(\frac{3}{6}\right)^2 = 0.11$$

$$= z_6^2 = \frac{(6-2)^2}{6} = \left(\frac{4}{6}\right)^2 = 0.44$$

$$= z_7^2 = \frac{(4-2)^2}{6} = \left(\frac{2}{6}\right)^2 = 0.11$$

$$= z_8^2 = \frac{(15-5)^2}{6} = \left(\frac{10}{6}\right)^2 = 2.76 \text{ Ans.}$$

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~~Q = No~~

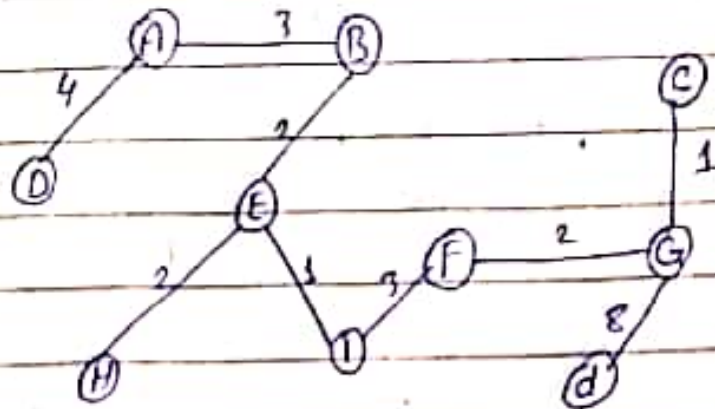
Q = No = 03

3 Ans = 03

In prims 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.

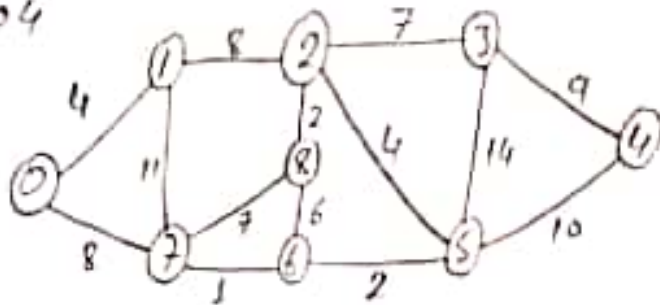


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Q4 = 04

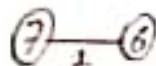
Ans = 04



1) Pick edge 7-6; No cycle is formed, include it.



2) Pick edge 8-2; No cycle is formed, include it.



3) Pick edge 6-5; No cycle is formed, include it



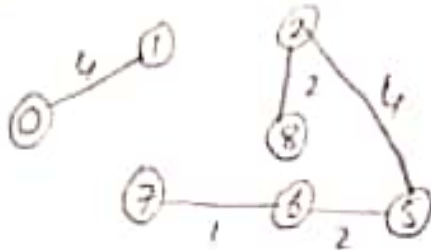
4) Pick edge 0-1; No cycle is formed, include,



(9)

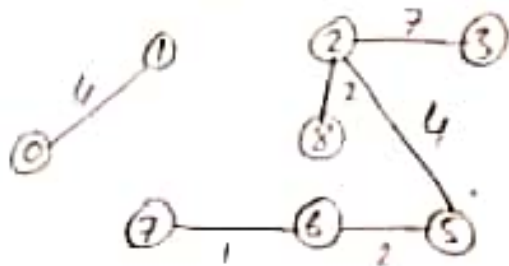
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5) Pick edge 2-5; No cycle is formed, include it.



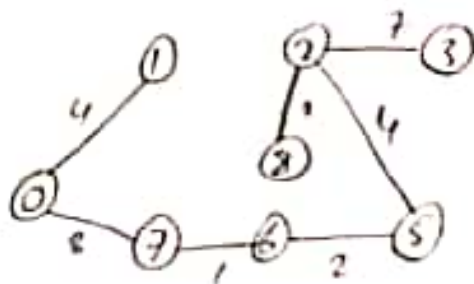
6) Pick edge 8-6; since including this edge results in cycle, discard it.

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



8) Pick edge 7-8; since including this edge results in cycle, discard it.

9) Pick edge 0-7 No cycle is formed, include it

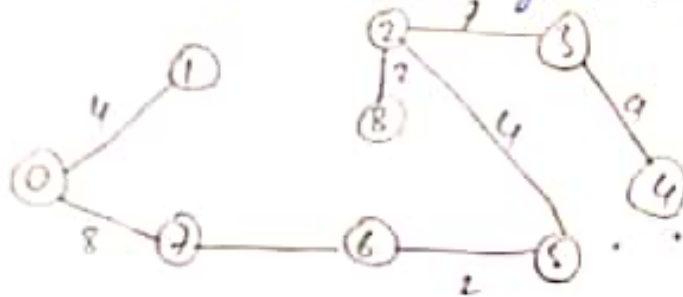


(10)

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10) Pick edge 1-2; since including this edge results in cycle, discard it.

11) Pick edge 3-4 No cycle is formed, include it.



Since the number of edges included equals $(v-1)$, the algorithm stops here..



Q5 = Ans 5

Operation Research:

Ans 5 It will help me alot in professional life because companies try to get most value out of their data analytics that serves investment, and Need the right individual to take it from low data to an interigent asset for Business.

And would be to determine the various alternatives that are available and then carry out an analysis that would enable me to access objectively and recommended the most suitable one.

It will also help me in these types of duties and skill:

- * Analyzing data and information.
- * spending lots of time on the computer with sophisticated math software.
- * Making decisions and solving problems.
- * Gathering data needed to solve those problems. Making full use of creative thinking abilities. interpreting the meaning of information for others.

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1) I have the opportunity to solve real-world problems:-

These problems matter to organization and have an impact. In areas such as healthcare, public policy, resource management, and disaster relief, you can truly change people's lives for the better.

2) I can use your analytical skills and your creativity:-

Whether your background is math, software engineering, computer science, or an industry such as healthcare, manufacturing, finance, ~~gov~~ government or military, there is a job in O.R. for you.

3) I don't have to subscribe to a dominated worldview:-

O.R. has no single mode of professional practice so you never have to get bored or pigeonholed into a specific technique or problem-solving approach that never changes.

4) I become an essential ~~the~~ link between technology department and organizational management.

5) I can make a great ^{living} link

6) I not part of a feed.

7) I can have fun at work.

8) I extremely relevant today.

