CS & IT ENGINEERING

Algorithms

'Dynamic Programming' & 'Graph Algorithm'

DPP Discussion Notes

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01 Question

02 Discussion

Q.1

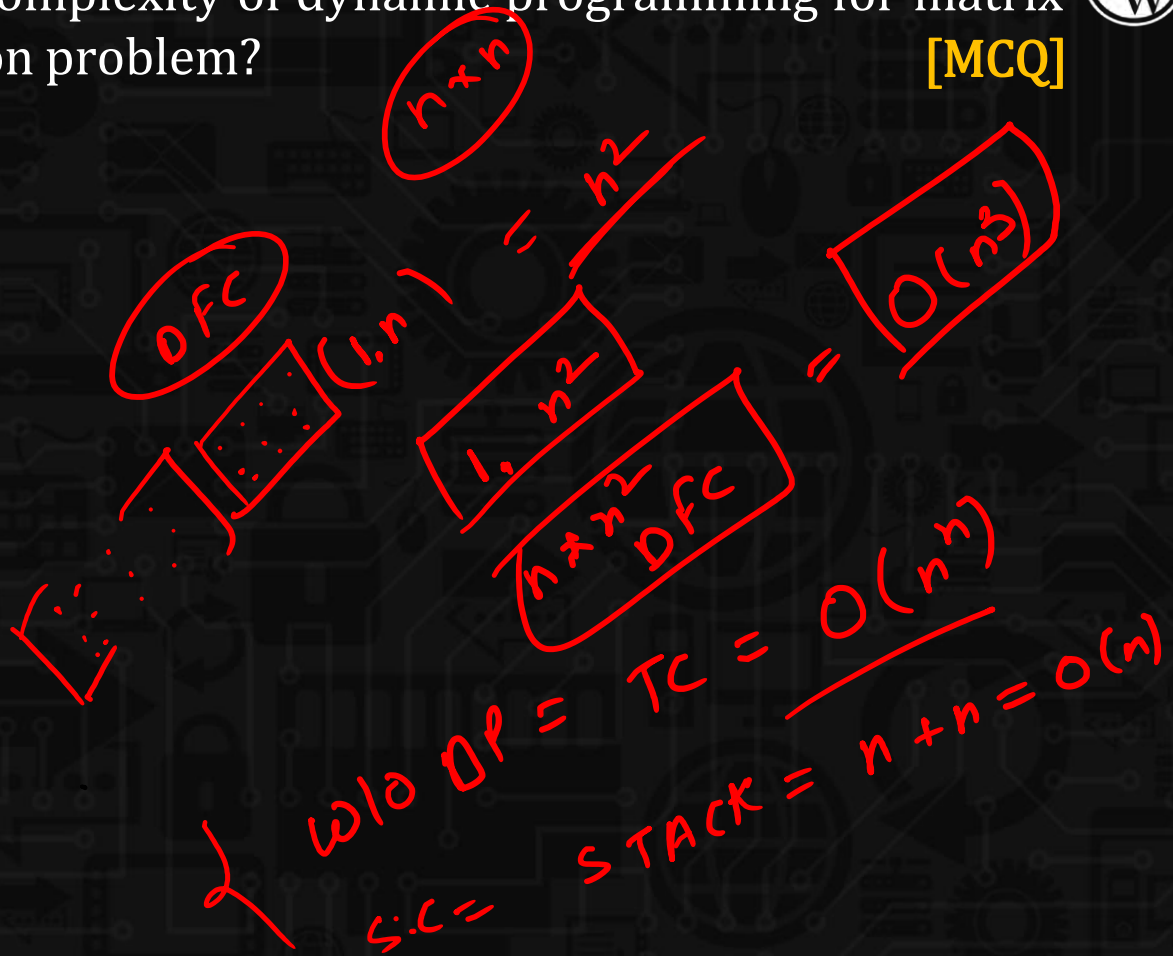
What is the time complexity of dynamic programming for matrix chain multiplication problem? [MCQ]

A. $O(n^2)$

B. $O(n^3)$

C. O(nlogn)

D. None of these



Q.2

Consider the matrices x, y and z with dimension 10 × 20, 20 × 30, 30 × 40 respectively. Then what is the minimum number of multiplications required to multiply the matrices? _____ [NAT]

18000

$x = 10 \times 20$ → 10×30

$y = 20 \times 30$ → 20×40

$z = 30 \times 40$

$(x\ y\ z)$

$(xy)\ z$

$10 \times 30 \quad 30 \times 40$

$10 \times 20 \times 30 = 6000$

$+ \quad 10 \times 30 \times 40 = 12000$

18000

$x\ (yz)$

$10 \times 20 \quad 20 \times 40$

$20 \times 30 \times 40 = 24000$

$+ \quad 10 \times 20 \times 40 = 8000$

32000

Q.3

What is the length of the LCS for the pair of subsequences given below.

P = ATGACTATAA

Q = GACTAATA

[MCQ]

A. 5

B. 6

C. 7

D. 8

Q.4

Consider a connected weighted graph G = (V, E), where |V| = n, |E| = m, if all the edges have distinct positive integer weights, then the maximum number of minimum weight spanning trees in the graph is ?

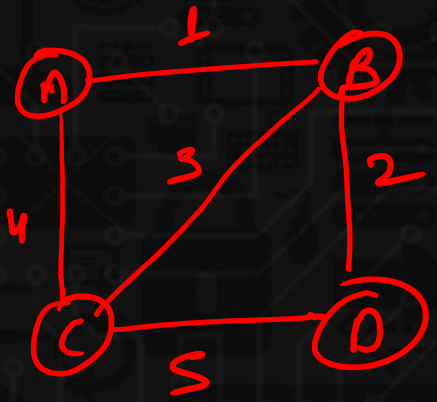
[MCQ]

A. n

B. m

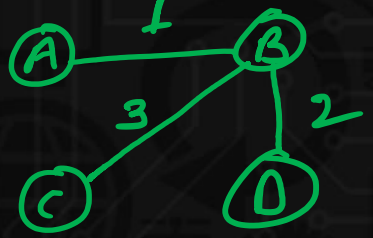
C. 1

D. n^{n-2}



|V| = 4

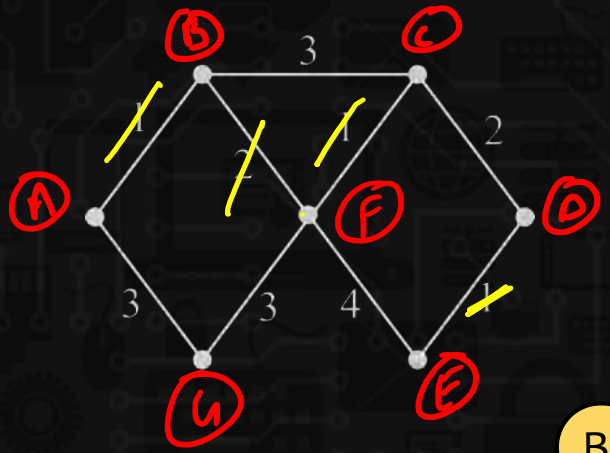
|E| = 5



n vertices & (n-1) edges of MST

Q.5

What is the weight of the minimum spanning tree for the graph shown below? [MCQ]

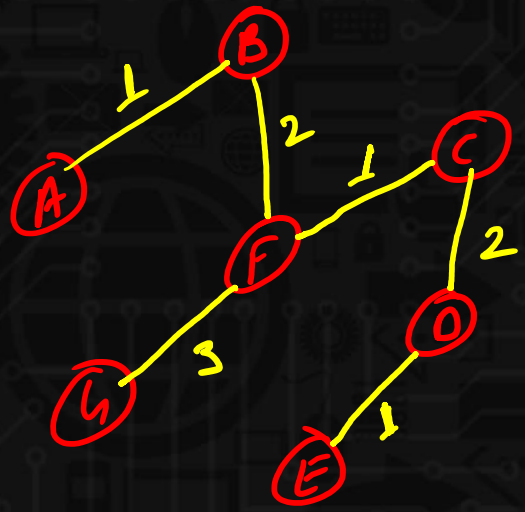


A. 7

B. 8

C. 9

D. 10



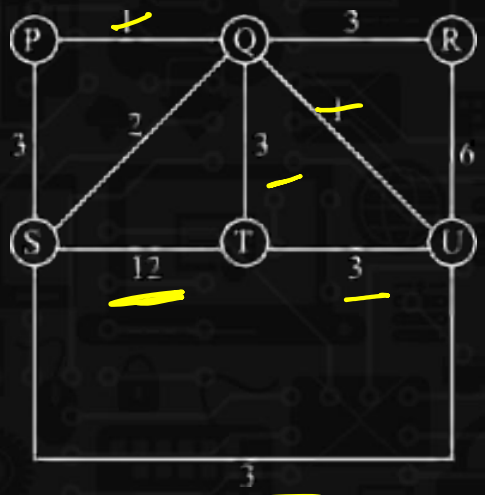
$1+1+1+2+2+3$

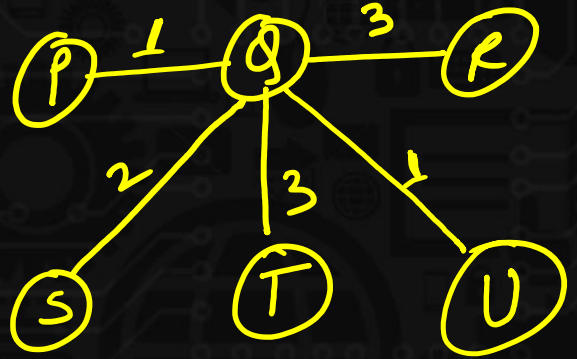
10

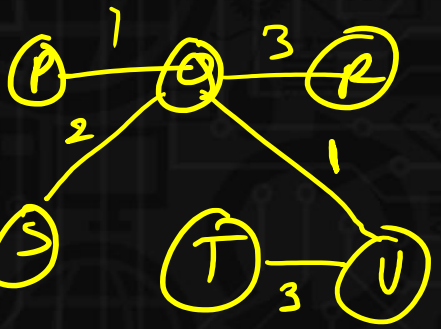
Q.6

How many minimum spanning tree does this graph have?

[MCQ]







A. 2

B. 3

C. 4

D. 5

Q.7

Consider the following problem with knapsack capacity of 8 kg

Items	Profits	Weights
I_1	13	1
I_2	8	5
I_3	7	3
I_4	3	4

weight = 8

Which of the following item is not selected in the optimal solution of 0/1, knapsack problem? [MCQ]

Profit = 23

A. I_1 only

B. I_2 only

C. I_3 only

D. I_4 only

$I_1 - 13$ 1

$I_2 - 8$ 5

$I_3 - 7$ 3

$I_4 - 3$ 4

$5, 3 = 8 + 7 = 15$

$1, 3, 4 = 13 + 7 + 3 = 23$

Q.8

Consider the following statements

S1: for every weighted graph and any two vertices p and q, Bellman ford algorithm starting at p will always return a shortest path to q.

S2: At the termination of Bellman ford algorithm even if graph has negative weight cycle, correct shortest path is found for vertex for which shortest path is well-defined.

[MCQ]

Which of the statement is correct?

A. only S1

B. only S2

C. Both S1 and S2 are true

D. neither S1 nor S2 is true


Before Solve DPP
Revision notes all over
Numerical of class
DPP → WT → PYQ & TS
THANK YOU GW SOLDIERS !