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# Unit 9 - Week 8

## Course outline

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## Week 8: Assignment

**If there are more than one correct answer take the most appropriate one.**

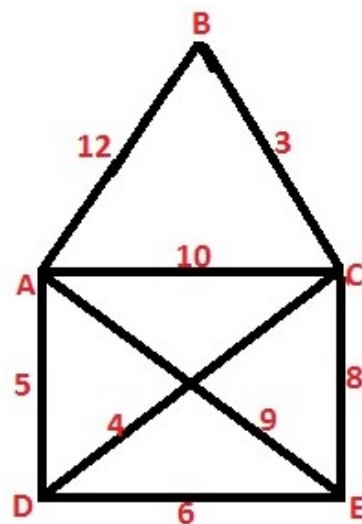
1) Form a recursion tree using the Longest common subsequence recursion formula for the values  $m=12$ ,  $n=7$  and find the first pair of overlapping numbers. **1 point**

- ☐ A) 11,5
- ☐ B) 12,6
- ☐ C) 11,6
- ☐ D) 10,7

**Accepted Answers:**

**C) 11,6**

2) In the following graph which edges form the Minimum Spanning Tree? (Use Prim's Algorithm, **1 point** start from vertex B)



- ☐ A) BC,CE,BE,DE
- ☐ B) BC,CE,AD,BD
- ☐ C) BC,CE,AE,AD
- ☐ D) BC,CD,AD,DE

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**Accepted Answers:***D) BC,CD,AD,DE*3) If a graph has  $n$  vertices, how many edges will be there in its Minimum Spanning Tree?**1 point**

- ☐ A)  $n$
- ☐ B)  $n-1$
- ☐ C)  $n-2$
- ☐ D)  $n+1$

**Accepted Answers:***B)  $n-1$* 

4) Consider the two subsequences CADBEAB and CBADEBA, construct the dynamic programming table to find the length and value of the longest common subsequence. From the table find the values in the last row of the table. While drawing the table take the first sequence along the x axis and the second sequence along the y axis. **1 point**

- ☐ A) 0 1 2 3 4 5 5
- ☐ B) 0 1 2 3 3 4 4 5
- ☐ C) 0 1 2 3 4 4 4 5
- ☐ D) 0 1 2 3 4 4 5 5

**Accepted Answers:***D) 0 1 2 3 4 4 5 5*5) What is the time complexity of Prim's algorithm, provided the data structure used is an Array? **1 point**

- ☐ A)  $O(V^2)$
- ☐ B)  $O(\log V)$
- ☐ C)  $O(1)$
- ☐ D)  $O(V \cdot \log V)$

**Accepted Answers:***A)  $O(V^2)$* 6) In an undirected graph  $G=(V,E)$ , the edge set cardinality  $|E|$  is**1 point**

- ☐ A)  $O(V)$
- ☐ B)  $O(1)$
- ☐ C)  $O(V^2)$
- ☐ D)  $O(\log V)$

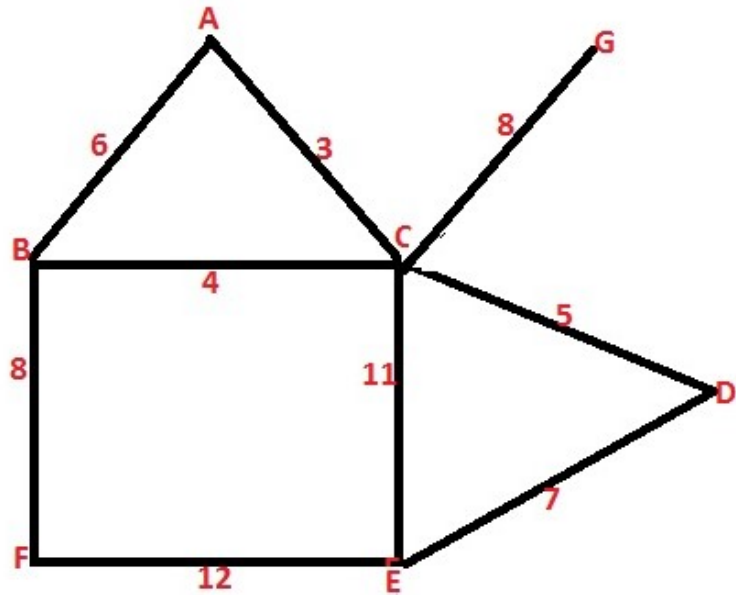
**Accepted Answers:***C)  $O(V^2)$* 

7) The time complexity of solving the Longest Common Subsequence problem using Dynamic Programming is : ( $m$  and  $n$  are lengths of subsequences) **1 point**

- ☐ A)  $O(m \cdot n)$
- ☐ B)  $O(m+n)$
- ☐ C)  $O(\log m \cdot n)$
- ☐ D)  $O(m/n)$

**Accepted Answers:***A)  $O(m.n)$* 

8) Consider the following Graph, while forming the Minimum Spanning Tree of this graph using **1 point** Prim's Algorithm, which are the first two edges that will be added?( Start from vertex C)



- ☐ A) CA and CD
- ☐ B) CA and CG
- ☐ C) CA and AB
- ☐ D) CA and CB

**Accepted Answers:***D) CA and CB*

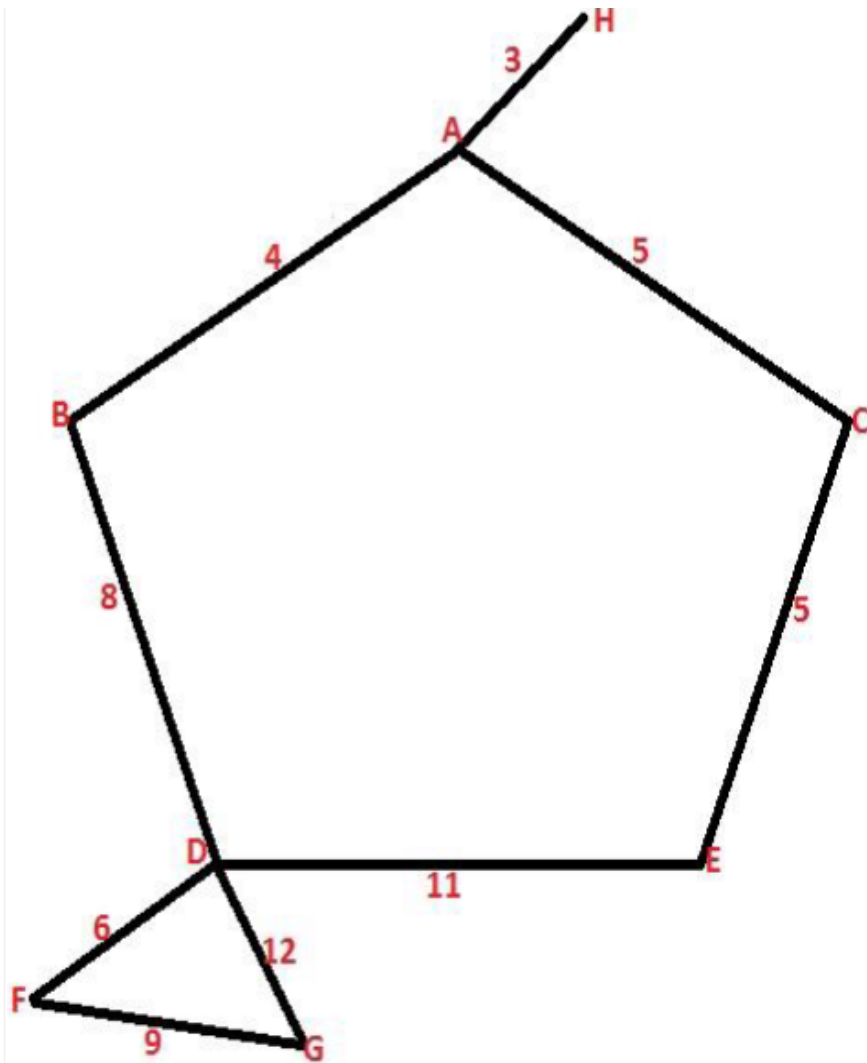
9) Prim's Algorithm is used to:

**1 point**

- ☐ A) Find the shortest path from one vertex to another
- ☐ B) Find the Longest Common Subsequence
- ☐ C) Find the Minimum Spanning Tree
- ☐ D) Sort edge weights

**Accepted Answers:***C) Find the Minimum Spanning Tree*

10) While forming the Minimum Spanning Tree of the following graph using Prim's Algorithm, in **1 point** what order will the edges be added?(Start from Vertex A)



- ☐ A) AH,AB,AC,CE,BD,DF,FG
- ☐ B) AH,AB,AC,CE,BD,DF,DG
- ☐ C) AH,DE,AC,CE,BD,DF,FG
- ☐ D) AH,AB,DG,CE,BD,DF,FG

**Accepted Answers:**

A) AH,AB,AC,CE,BD,DF,FG

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