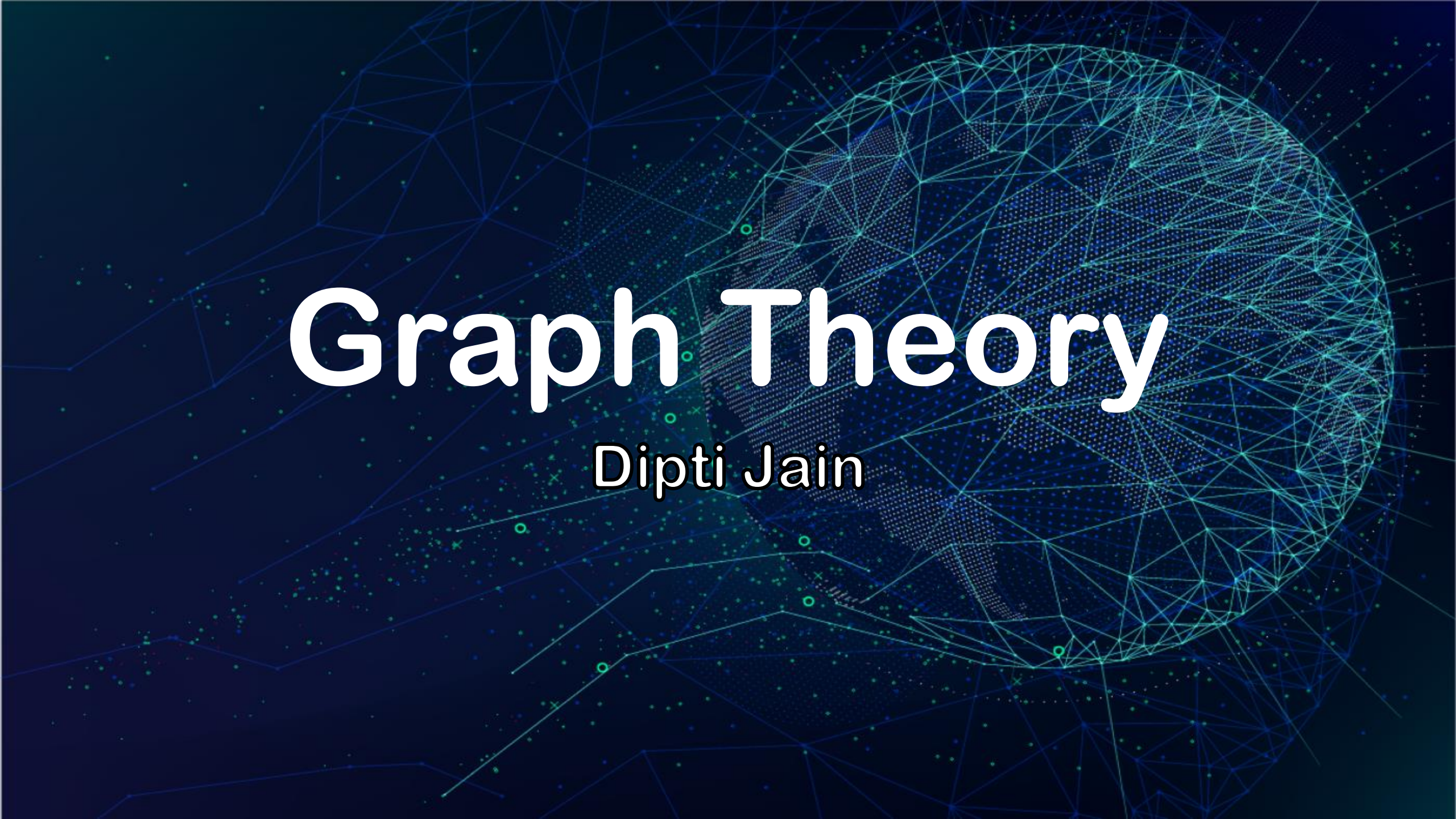
Graph Theory
Dipti Jain

Assignment

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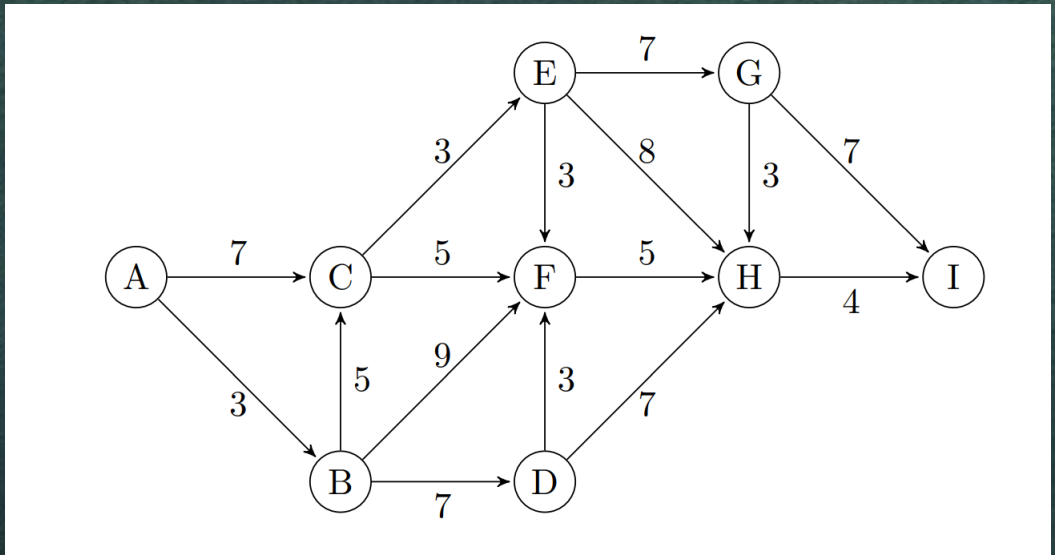
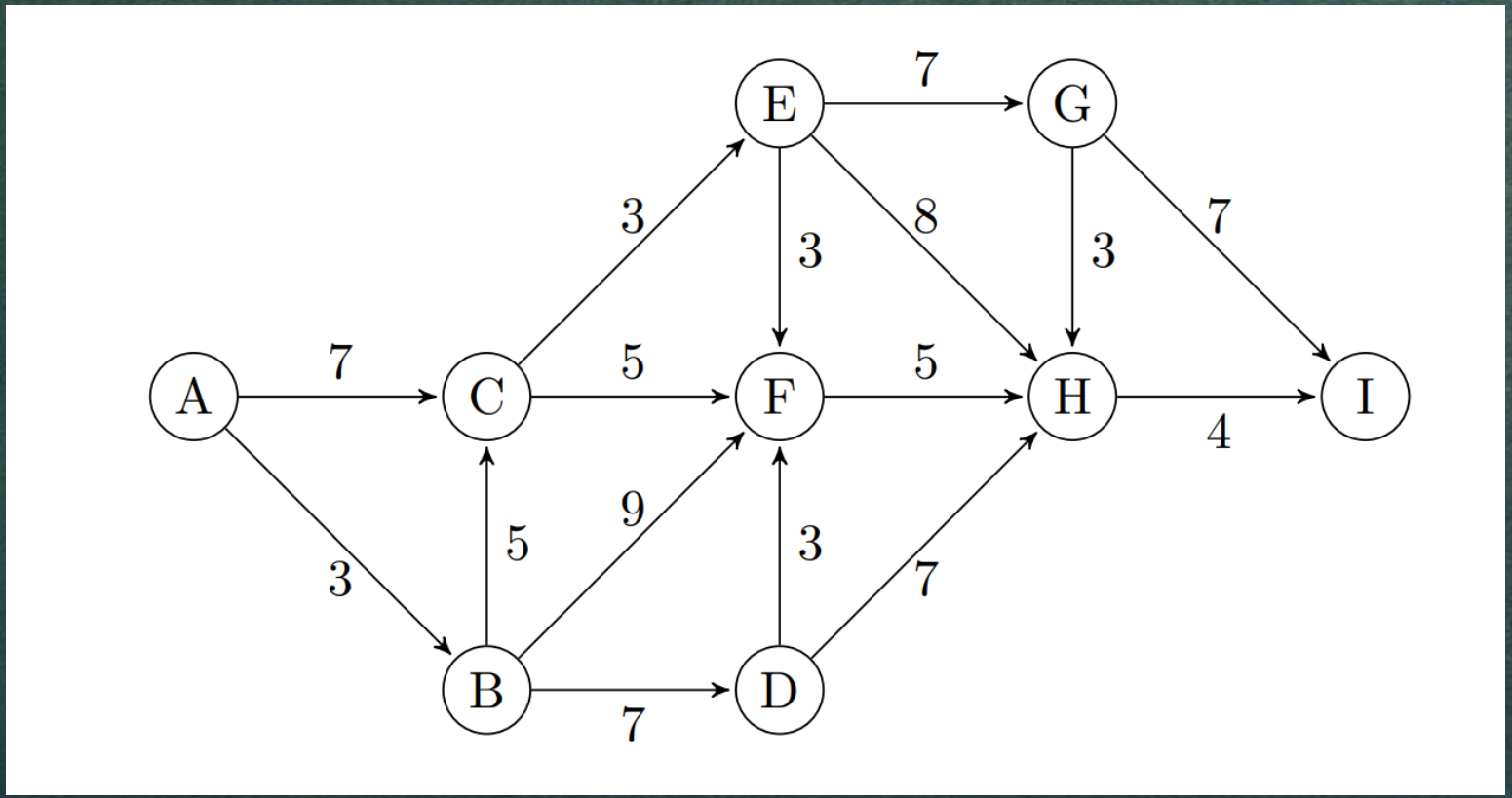
Graph Theory

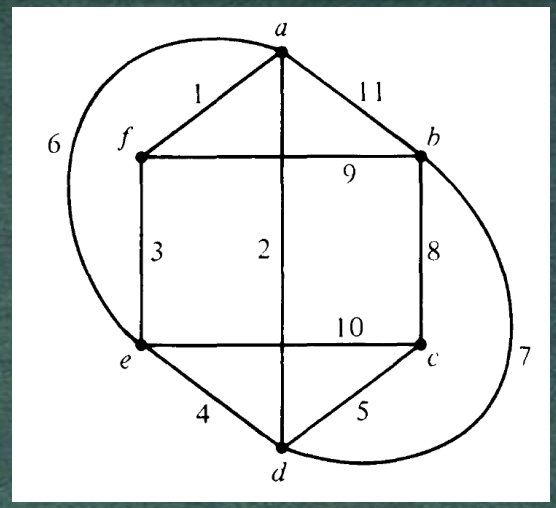
1. Can a simple graph have 5 vertices and 12 edges? If so, draw it; if not, explain why it is not possible to have such a graph.
2. Consider the graph given below :



a) What is the length of shortest path from A to I ? For which edges ‘e’ shortening ‘e’ by 0.1 will change s? For which edges ‘e’ will making e longer by 0.1 change s?

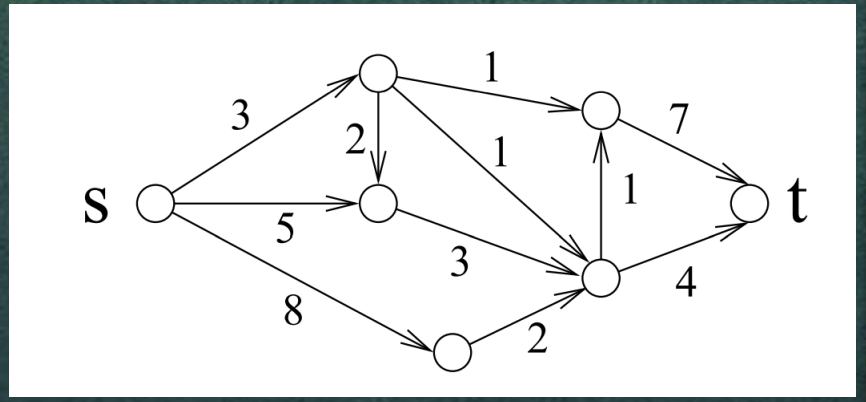


3. Find the weight of minimum spanning tree

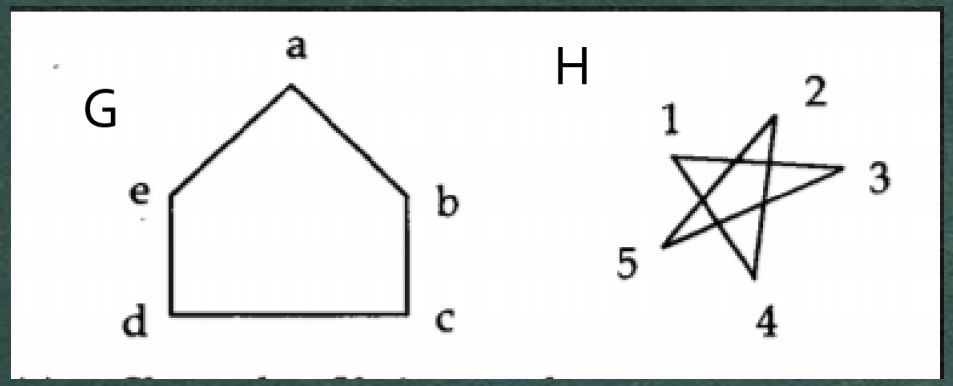


4. Consider the following graph:

   i. What is the maximum flow? Compute actual flow as well.



4. Are the following graphs isomorphic:



5. Let G be a graph such that every vertex has degree 4 and the number of edges is 12. How many vertices does G have ?

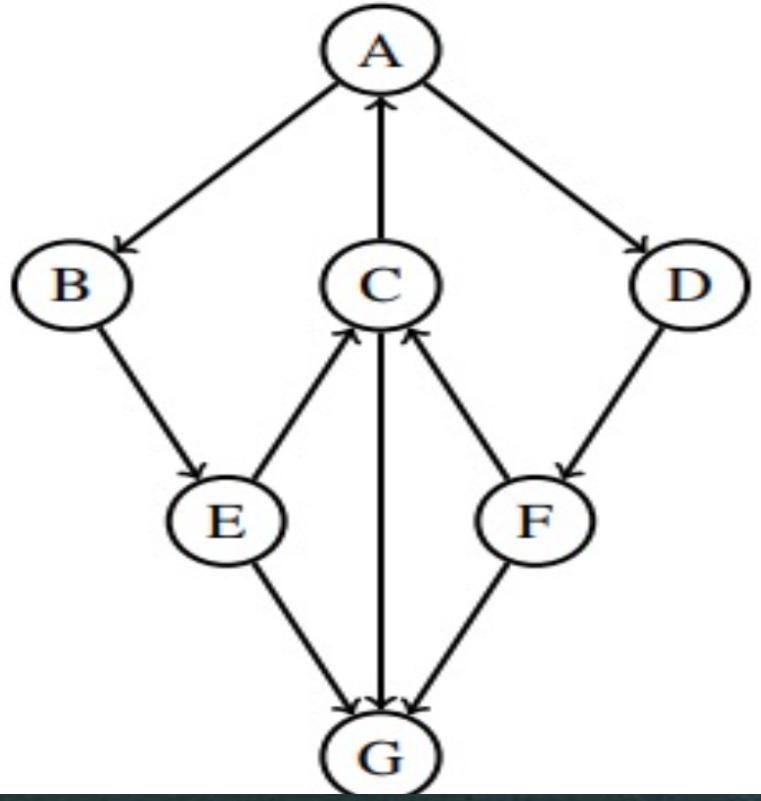
6. Draw the tree whose Pr¨ufer code is (1, 1, 1, 1, 6, 5)

7. Draw in the edges of the 8-vertex tree with the Prüfer code 112050.
8. Let G be a graph such that every vertex has degree 4 and the number of edges is 12. How many vertices does G have ?

9. Draw the tree whose Pr¨ufer code is (1, 1, 1, 1, 6, 5)

10. Consider the following graph :

Perform a depth-first search on the following graph starting at A. Label every edge in the graph with T if it's a tree edge, B if it's a back edge, F if it's a forward edge, and C if it's a cross edge.

Which of the following is true for B,F and C?

NOTE: Whenever faced with a decision of which node to pick from a set of nodes, pick the node whose label occurs earliest in the alphabet.