Name: Student ID:

Quiz #11 (4%)

CS2336 Discrete Mathematics, Instructor: Cheng-Hsin Hsu

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This is a take-home quiz. Please turn in your answer to the TA by June 12th, 2014. Please make appointment with the TA if you want your graded quiz back.

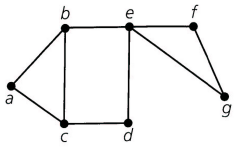
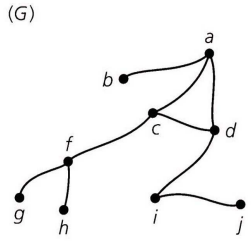


Figure 11.7

1) (1%) How many path are there from b to g?

   Solution: 6



2) (1%) (a) How many spanning subgraphs are there for the graph G? (b) how many of them are connected subgraphs?

   Solution:

a) $2^9 = 512$

b) 4

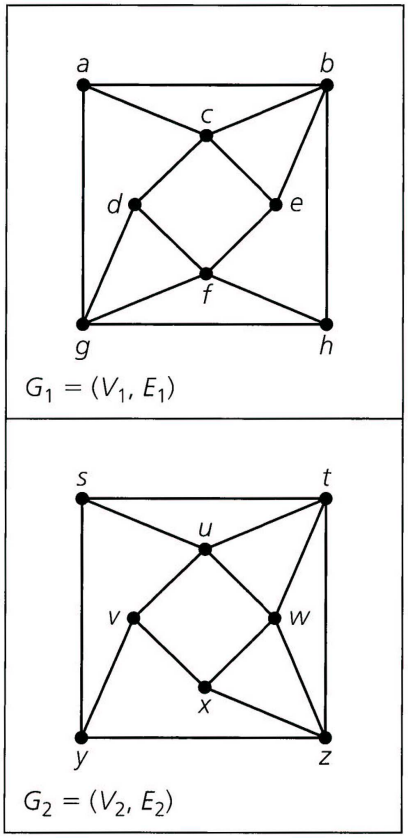


Figure 11.42

3) (1%) Let $G_1 = (V_1, E_1)$ and $G_2 = (V_2, E_2)$ be loop-free undirected connected graphs in the figure. (a) Determine $|V_1|$, $|E_1|$, $|V_2|$, and $|E_2|$. (b) Find the degree of each vertex in V_1 and V_2. (c) Are G_1 and G_2 isomorphic?

Solution:

a) $|V_1| = 8, |E_1| = 14, |V_2| = 8, and\, |E_2| = 14$

b) $|V_1| \Rightarrow \begin{cases} deg(a) = \ 3 deg(b) = \ 4 deg(c) = \ 4 deg(d) = \ 3 \\ deg(e) = \ 3 deg(f) = \ 4 deg(g) = \ 4 deg(h) = \ 3 \end{cases}$

$|V_2| \Rightarrow \begin{cases} deg(s) = \ 3 deg(t) = \ 4 deg(u) = \ 4 deg(v) = \ 3 \\ deg(w) = \ 4 deg(x) = \ 3 deg(y) = \ 4 deg(z) = \ 4 \end{cases}$

c) No.

4) (1%) (a) How many vertices and how many edges are there in the complete bipartite graphs $K_{4,7}$, $K_{7,10}$, and $K_{m,n}$, where m, n are positive integers. (b) if $K_{m,6}$ has 72 edges, what is m?

Solution:

	$\|V\|$	$\|E\|$
$K_{4,7}$	11	28
$K_{7,10}$	17	70
$K_{m,n}$	$m+n$	$m \cdot n$

a)

b) $M \cdot 6 = 72 \Rightarrow M = 12$