Graph Theory

Assignment 2
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Problem 9. Show that the characterizations D,E, and F for trees are correct. For this argue that any or all of A, B, and C imply D, E, and F and are implied by D, E, and F. **(2 Points)**

Problem 10. Find 4 classes of graphs which are Eulerian. By a class of graphs we mean a set $\mathcal{G} = \{G_1, G_2, \cdots\}$ so that $\mathcal{G}$ contains one graph for every natural number. For example the class $P = \{P_1, P_2, P_3, \cdots\}$ is the class of graphs where the nth graph is a path on n vertices. Try to find classes with as few number of edges as possible. **(1 Points)**

Problem 11. Describe an $O(E)$-time algorithm to find an Euler tour of G if one exists **(4 Points)**

Problem 12. Use Matrix Tree theorem to find a matrix whose determinant is $\tau(K_{m,n})$. Compute $\tau(K_{m,n})$. **(3 Points)**

Problem 13. Let G_n be the graph on $2n$ vertices and $3n-2$ edges pictured below, for $n1 \geq 1$.Determine $\tau(G_n)$. **(4 Points)**