School of Mathematical Sciences
National Institute of Science Education and Research

Problem Set - 5 M 208

1. Find the number of perfect matchings in K_n and $K_{n,n}$.
2. Prove that every tree has at most one perfect matching.
3. If G is a graph of order $2n$ and $\delta(G) \geq n$, then G has a perfect matching.
4. Let G be graph on n vertices. Then prove that $\alpha(G) \geq \frac{n}{\Delta(G)+1}$.
5. Show that Petersen graph has exactly 6 perfect matching.
6. For $k \geq 2$, prove that the k-cube Q_k has at least $2^{(2^{k-2})}$ perfect matching.
7. Let G be a graph with maximum matching of size $2k$. What is the smallest possible size of a maximal matching in G?