

## DM Assignment questions -- mid II

1. What is a bipartite graph and a complete bipartite graph? Give examples and explain their properties.
2. Differentiate between permutation and combination with examples.
3. State and prove the basic properties of trees. Give an example showing the use of a spanning tree.
4. How many 4-digit numbers can be formed using digits 1–9 such that digits do not repeat?
5. What are Eulerian and Hamiltonian paths? How are they different? Provide examples.
6. Using the inclusion-exclusion principle, find how many numbers from 1 to 100 are divisible by 2, 3, or 5.
7. Define chromatic number and explain graph coloring with an example. Why is

graph coloring important?

8. Explain Kruskal's algorithm with an example. How does it help in finding a minimum spanning tree?
9. State and prove Euler's formula for planar graphs. Provide an example.
10. How many permutations of the word "ENGINEER" are possible? Show steps and explain when letters are repeated.
11. Define a binary tree and explain different types of binary trees. How is tree traversal performed?
12. Explain the differences between a tree and a graph with suitable examples. When is a graph considered a tree?