

MIZAN-TEPI UNIVERSITY
COLLEGE OF NATURAL AND COMPUTATIONAL
SCIENCE
DEPARTMENT OF MATHEMATICS
Discrete Mathematics And Combinatorics
ASSIGNMENT(30%)
Summation date: 20/09/2017 E.C

1. Find the general solution (all the solutions) of the recurrence relation
 $a_n - 6a_{n-1} + 12a_{n-2} - 8a_{n-3} = n^2 2^n, \quad n \geq 3$
2. Draw:
 - a. a connected graph with eight vertices;
 - b. a disconnected graph with eight vertices and two components;
 - c. a disconnected graph with eight vertices and three components.
3. Use the handshaking lemma to prove that every tree with n vertices, where $n \geq 2$, has at least two vertices of degree 1.
4. Use a proof by contradiction to show that the removal of an edge cannot disconnect a tree into more than two components.
5. Draw:
 - i. . two non-isomorphic regular graphs with 8 vertices and 12 edges;
 - ii. . two non-isomorphic regular graphs with 10 vertices and 20 edges.