**GRAPH THEORY AND COMBINATORICS**

**ASSIGNMENT 2**

**Submission Date: 15-11-2019**

**Question Nos: 1 and 2 for Even roll number students**

**Question Nos: 3 and 4 for Odd roll number students**

1. Let B and A be, respectively, the circuit matrix and the incidence matrix of a self-loop-free graph. Then prove that

A.BT=0 (mod 2)

1. Show that for a simple disconnected graph of *k* components, *n* vertices and *e* edges the ranks of matrices A, B and C are *n-k, e-n+k* and *n-k* respectively where A is the incidence matrix, B is the circuit matrix and C is the cut-set matrix.
2. Explain Dijkstra’s algorithm with example.
3. Draw the flowchart of spanning tree algorithm and write the algorithm that clearly mentions the five conditions to be tested in connection with the spanning tree construction.