

W-3315**M.A./M.Sc. (Fourth Semester) Examination, June-2020****MATHEMATICS****Paper - 407****Advanced Graph Theory***Time : Three Hours*

Maximum Marks : 85 (For Regular)

Minimum Pass Marks : 29

Maximum Marks : 100 (For Private)

Minimum Pass Marks : 34

Note : Attempt **all** questions.**Unit-I**

- Q.1. What is Hamiltonian paths and circuits? Explain by a suitable example. Also explain the difference between a Hamiltonian circuit and an Eulerian circuit.

Unit-II

- Q.2. Define rooted and binary trees in a graph with suitable examples and prove that.
- The number of vertices n in a binary tree is always odd.
 - If p be the number of pendant vertices in a binary tree with n vertices then prove that $p = (n+1)/2$

Unit-III

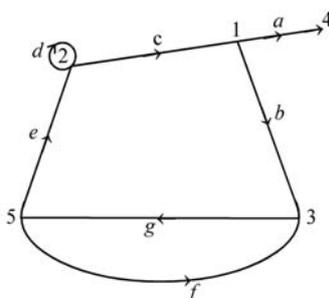
- Q.3. a) Prove that the vertex connectivity of any graph G Can never exceed the edge connectivity of G .
b) Show that the complete graph of five vertices is non-planar.

Unit-IV

- Q.4. Define proper colouring of a graph and prove that every tree with two or more vertices in 2-chromatic.

Unit - V

- Q.5. Define a digraph with a suitable example and find the adjacency matrix of the following digraph.

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