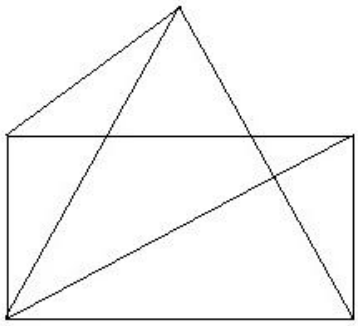
Assignment – IV

MATHEMATICS – III

SEMESTER-IV (CS/IT), Paper Code: M401

Advanced Graph Theory

1) Draw the dual of the graph.



2) If G be a connected graph with n vertices, e edges and r faces, prove that n – e + r = 2

3) A regular graph G determines 8 regions, degree of each vertex being 3. Find the number of vertices of G.

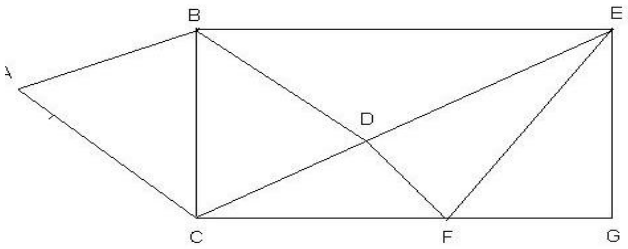
4) Define planar graph. Construct a planar graph with 6 vertices.

5) Prove that a planar graph with n vertices, e number of edges and k number of components, determines f number of regions, where $f = e - n + k + 1$.

6) Prove that the chromatic polynomial of a tree with n vertices is $x(x-1)^{n-1}$, whose x is the no. of colours.

7) Show that every planar graph is 6 colourable.

8) Find the chromatic number of the following graph



9) Prove that a graph G is 2-chromatic if and only if it is bi-partile.

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