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CS 225: Discrete Structures in CS

Homework 9 – Part 1

Set 10.1

#9 (i).

e1, e2, e7

(ii).

v1, v2

(iii).

e2, e7

(iv).

e1, e3

(v).

e4, e5

(vi).

v4

(vii).

2

(viii).

14

#22.

This kind of graph does not exist because the most degrees a graph of 5 vertices can have is 4.

#37f.

The graph is not bipartite since $v1 \in V1$, $v2 \in V2$, $v3 \in V1$ and $v4 \in V2$. v5 isn't an element of either set.

#44a.

Yes because there are at most n-1 edges between a vertex and another vertex.

b.

Based off what we know from above, a graph with 4 vertices (n), means each degree is n-1 giving us degrees of 0,1,2 and 3. v3 must be connected to all other vertices but v0 cannot be connected since it has no edges. Therefore the answer is no.

c.

Similar to above, there cannot be a graph with all different degrees if there exists a vertex degree of 0.