Quiz # 28   Name: _____Key_____

You must show your work to get full credit.

Let G be a graph with vertices $V G)$ and edges $E(G)$.

1. Define the following:

   (a) e is **loop** in G.

   An edge that has only one end point: ⬭
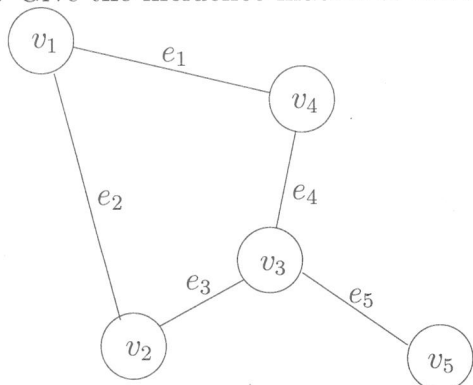
   (b) The graph is **simple**.

   It has no looks or parullel edges.

   (c) The **incidence matrix** of G.

   ✗

2. Give the incidence matrix of the following graph.

$$
\begin{array}{c}
 \\ v_1 \\ v_2 \\ v_3 \\ v_4 \\ v_5
\end{array}
\begin{array}{ccccc}
e_1 & e_2 & e_3 & e_4 & e_5 \\
\left[\begin{array}{ccccc}
1 & 1 & 0 & 0 & 0 \\
0 & 1 & 1 & 0 & 0 \\
0 & 0 & 1 & 1 & 1 \\
1 & 0 & 0 & 1 & 0 \\
0 & 0 & 0 & 0 & 0
\end{array}\right]
\end{array}
$$

3. For the graph above list

   The vertices of degree 1 _____v_5_____

   The vertices of degree 2 ___v_1, v_2, v_4___

   The vertices of degree 3 _____v_3_____

4. Draw a graph with incidence matrix
$$
\begin{array}{c}
e_1\;e_2\;e_3\;e_4 \\
\left[\begin{array}{cccc}
1 & 0 & 1 & 1 \\
1 & 1 & 0 & 1 \\
0 & 1 & 1 & 0
\end{array}\right]
\begin{array}{c}v_1\\v_2\\v_3\end{array}
\end{array}
$$