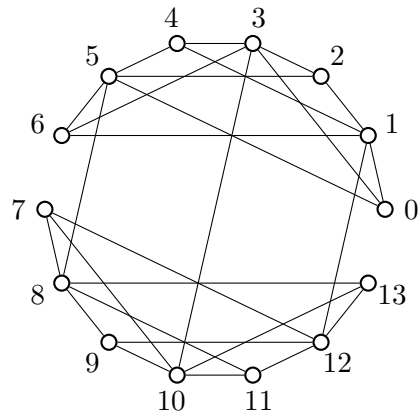


Let G be the following graph:



(a) Is G bipartite? Justify your answer.

Solution: Yes. Every edge has one even-numbered vertex E and one odd-numbered vertex O . The graph is bipartite with respect to partition E, O .

(b) Does G have a perfect matching? Justify your answer.

Solution: No. The neighbor set of $\{0, 2, 4, 6\}$ is $\{1, 3, 5\}$, which is smaller, so 0, 2, 4, and 6 cannot all be matched.