Q.1 Explain the AA with vertex cover problem. And prove that vertex cover problem is 2-approximate algorithm (AA).
Q.2 Solve the following linear programming problem using simplex method.
Maximize: \( 7x_1 + 8x_2 + 10x_3 \)
Subject to: 
\[
\begin{align*}
x_1, x_2, x_3 & \geq 0 \\
2x_1 + 3x_2 + 2x_3 & \leq 1000 \\
x_1 + x_2 + 2x_3 & \leq 800
\end{align*}
\]

Q.3 Write short note on any of one (a) String matching with FA       (b) Rabin Karp matching algorithm.

Q.4 For the given network, find the maximum flow from S to T, using Ford Fulkerson Method.