## FACULTY OF MECHANICAL ENGINEERING UNIVERSITI TEKNOLOGI MALAYSIA

SKMM 2413 APPLIED THERMODYNAMICS	Semester II 2014-2015
Project	Due : Week 11

- 1. Consider a gas turbine engine working on a simple Brayton cycle. Under air standard analysis,
  - a. Derive the cycle thermal efficiency as a function of pressure ratio, r<sub>p</sub>.
    - i. Using Matlab or Octave, plot the efficiency over a wide range of  $r_p$  and estimate the maximum efficiency.
    - ii. Different gases can be represented by their respective k. With Matlab or Octave, investigate and comment how changing the k would change the efficiency over the same range as above. Choose three common gases and plot on the same graph.
  - b. Derive the optimum pressure ratio that will give maximum net work output.
    - i. Based on your results above, for air, what is the thermal efficiency for this optimum pressure ratio?
    - ii. Plot the net work versus pressure ratio for the three gases above and comment.

Your report should also include the Matlab/Octave program.