UNIT 61: ENGINEERING THERMODYNAMICS

Unit code: D/601/1410 QCF level: 5 Credit value: 15

ASSIGNMENT 1.1 CLOSED THERMODYNAMIC SYSTEMS.

Assignment front sheet to be attached to assignment when submitted for assessment.

NAME:

You are allowed a maximum of 4 weeks from the date of issue to complete this assignment.

Date Issued Date submitted

I agree to the assessment as contained in this assignment. I confirm that the work submitted is my own work.

Signed

Pass Criteria

Outcome	Assessment Criteria	Achieved
1.Investigate systems thermodynamic	• investigate polytropic processes	
	• define thermodynamic systems and their properties	
	• apply the 1 st law of thermodynamics to thermodynamic systems	
	• determine the relationships between system constants for an ideal gas.	

Grading Criteria

Grade	Descriptor	Achieved
MERIT	• use a range of methods and techniques to collect, analyse and process information/data. • Apply and analyse detailed knowledge and skills, using relevant theories and techniques. • Coherently present and communicate work using technical language correctly.	
DISTINCTION	• Check validity when collecting, analysing and processing complex information/data. • Evaluate and synthesise relevant theories and techniques to generate and justify valid conclusions. • Show an individual approach in representing and communication work coherently, using technical language fluently.	

Feedback Comments

Brief I,V. by Date IV

Grade Awarded Tutor Signature Date

DETAILS

A research project is to be carried out concerning the affect of different types of gas on a simple gas compressor.

The compressor may be idealised as a frictionless piston fitted inside a cylinder containing gas at a pressure of 100 kPa, volume of 0.001 m^3 and temperature of 20 ^oC. The gas is compressed reversibly to a volume of 100 cm^3. Work is done to move the piston and heat is transferred to the cooling system around the cylinder.

Calculate the work done and the heat transfer when the expansion is ***ADIABATIC, ISOTHERMAL and POLYTROPIC with an index n=1.3.***

Each student will be allocated a gas from the following list.

Hydrogen Helium Argon Ammonia Carbon Monoxide Carbon Dioxide Sulphur Dioxide Oxygen Dichlorodiflouromethane and Air

You must find all the required properties of the gas in order to solve the problem. It should be assumed that the mean temperature of the process is around 300 K and the properties of the gas should be obtained at this temperature. You must use appropriate formulae from your notes.

Collect data from the other members of the class and rank them in order with the gas requiring the least work first and the gas requiring the most work last. Draw any other useful conclusions based on all the work. You may use any suitable software (e.g. Mathcad) to calculate results and plot graphs.