

QUIZ 1A - APPLIED THERMODYNAMICS

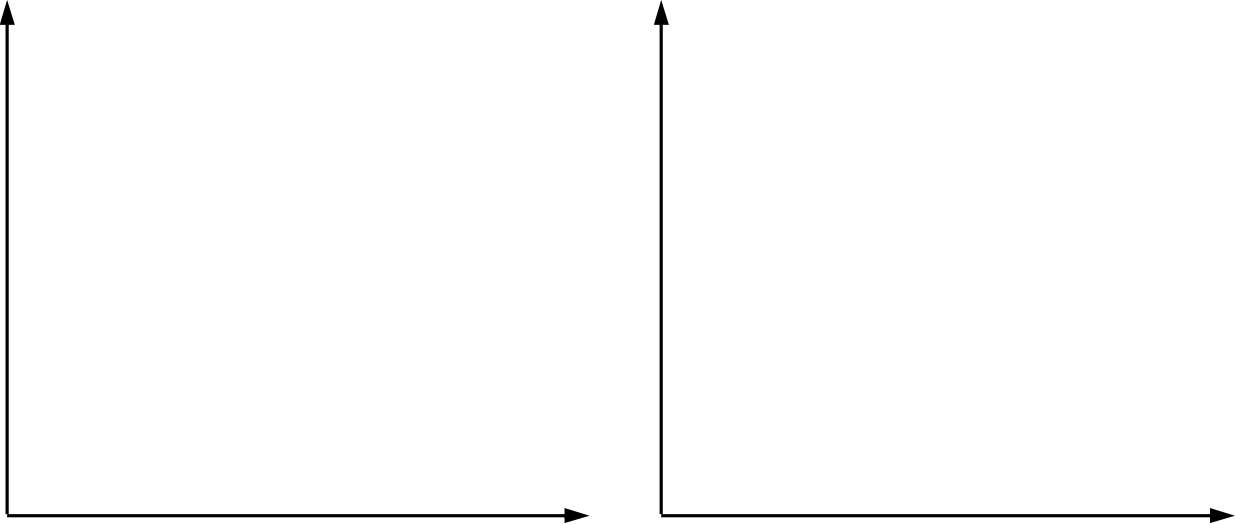
NAME:

ID. NO.:

Q1. Sketch $P-V$ diagram for Otto and Diesel cycle. Discuss the differences between these two cycles.

(7 mark)

ANSWER



Q2. An ideal Otto cycle with air as the working fluid has a compression ratio of 10. The minimum and maximum temperatures in the cycle are 300 and 1340 K respectively. Accounting for the variation of specific heats with temperature, sketch P - V diagram of the cycle and determine:

- a) The amount of heat transferred to the air during the heat addition process
- b) The net work output (kJ/kg)

(18 marks)

ANSWER



QUIZ 1B - APPLIED THERMODYNAMICS

NAME:

ID. NO.:

Q1. An ideal Otto cycle with a specific compression ratio is executed using air, argon and ethane as the working fluid. For which case will the thermal efficiency is the highest. Sketch the thermal efficiency as a function compression ratio for the three working fluids (use scale range 0 to 12 for the compression ratio).

(7 mark)

ANSWER



Q2. An idea Otto cycle has a compression ratio of 11, takes in air at 100 kPa and 25 °C. The rotational speed of the cycle is 2000 rpm. Using constant specific heats at room temperature, sketch P - V diagram of the cycle and determine the thermal efficiency and the rate of heat input if the cycle produces 180 kW of power

(18 marks)

