Name:

Grade:

Due Date: 22/06/2022 (Due at the time of class)

Solve the following problems. Clearly justify all your assumptions.

Problem 1:

A four-cylinder, two-stroke cycle diesel engine with 10.9-cm bore and 12.6-cm stroke produces 88 kW of brake power at 2000 RPM. Compression ratio $r_c = 18{:}1$.

Calculate:

(a) Engine displacement. [cm^3, L]
(b) Brake mean effective pressure. [kPa]
(c) Torque. [N-m]
(d) Clearance volume of one cylinder. [cm^3]

Problem 2:

A four-cylinder, 2.4-liter engine operates on a four-stroke cycle at 3200 RPM. The compression ratio is 9.4:1, the connecting rod length $r = 18$ cm, and the bore and stroke are related as $S = 1.06B$.

Calculate:

(a) Clearance volume of one cylinder in cm^3, L, and $in.^3$.
(b) Bore and stroke in cm and in.
(c) Average piston speed in m/sec and ft/sec.

Problem 3:

What are the advantages of an over square engine? What are the advantages of an under square engine?