

大葉大學 九十二 學年度 研究所碩士班 招生考試試題紙

系 所 別	組 別	考 試 科 目 (中 文 名 稱)	考 試 日 期	節 次	備 註
車輛工程研究所	甲	內燃機	4 月 13 日	第 2 節 <small>(0:30~1:00)</small>	可攜帶 計算機

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1. (40%)

Give definitions of the following terms:

- (a) mean effective pressure (b) ignition delay
 (c) volumetric efficiency (d) brake specific fuel consumption
 (e) octane number (f) exhaust gas recirculation
 (g) compression ignition engine (h) cycle to cycle variation

2. (10%)

For two-valve (or four-valve) engines, are their exhaust valves smaller than inlet valves? Explain why.

3. (20%)

Describe how engine knock occurs in a spark ignition engine, explain its combustion process, and draw corresponding pressure profiles for the combustion chamber.

4. (20%)

A truck has a five-liter, V-6, SI engine operating at 2400 RPM. The compression ratio $r_c = 10.0$, the volumetric efficiency $\eta_v = 0.92$, and the bore and stroke are related as $S=0.92B$.

- Calculate: (a) Stroke length. [cm]
 (b) Average piston speed. [m/sec]
 (c) Clearance volume of one cylinder. [cm³]
 (d) Air flow rate into engine. [kg/sec]

5. (10%)

The brake torque of a two-liter, L-4, SI engine operating at 3000 RPM is 150 N-m. The engine's mechanical efficiency is 92%.

- Calculate: (a) Brake power. [kw]
 (b) Indicated power. [kw]