大葉大學 九十三 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	3月28日	第二節 (09:30~12:00)	請帶計算機

註：考生可否攜帶計算機或其他資料作答，請在備註欄註明（如未註明，一律不准攜帶）

共 1 頁

1. (20%)

   Explain the following parameters and by which measured data these parameters can be calculated? (i) brake mean effective pressure,(bmep), (ii) brake specific fuel consumption, (bsfc), (iii) air-fuel ratio (A/F), (iv)volumetric efficiency. (η_v)

2. (15%)

   A four-cylinder, four-stroke, spark-ignition engine has a bore of 80 mm and stroke of 80 mm. The compression ratio is 8. Calculate the engine displacement volume and the clearance volume for each cylinder in cubic centimeter,(cc).

3. (15%)

   A single-cylinder, four-stroke diesel engine having a displacement volume of 790 cc is tested at 300 rpm. When a braking torque of 49 Nm is applied, analysis of the indicator diagram gives a mean effective pressure of 980 kPa. Calculate the brake power and mechanical efficiency of the engine.

4. (15%)

   Air-standard ideal Otto cycle has a compression ratio of 6:1. The pressure and temperature at the commencement of compression are 1 bar and 27℃. The heat added during the constant volume combustion process is 1170 kJ/kg. Determine the peak pressure and temperature, work output per kg of air and the air-standard cycle thermal efficiency. Assuming constant volume specific heat C_v=0.717 kJ/kg-K and specific heat ratio (γ)=1.4 for air.

5. (15%)

   Please compare the main advantages and drawbacks of two CI engine combustion chambers: direct injection (DI) and indirect injection (IDI), and show what kind of the fuel injection system must be coped with each chambers?

6. (20%)

   Explain the reasons for knocks in SI and CI engines and describe how these engines knocks will be affected by the following effects: (i) raising the engine coolant temperature. (ii)shortening the ignition delay (iii) turbo charging the intake pressure.(iv) using more active fuels.