淡江大學九十三學年度轉學生招生考試試題 501

系別：機械與機電工程學系三年級　　科目：熱　力　學

准帶項目請打「○」否則打「×」	
○	簡單型計算機

節次：7 月 14 日第 5 節

本試題共 1 頁

1. 選擇題(30%)

(1). A door to a refrigerator in a kitchen is open. Considering the kitchen as an insulated closed system, the internal energy in the kitchen will:(A) rise (B) fall (C) remain the same(D)become zero

(2). Which of the following is an extensive property of a system: (A) density (B) pressure (C)mass (D)velocity

(3). A heat engine with a thermal efficiency of 100% violates the: (A) Zeroth Law of Thermodynamics (B) 1st Law of Thermodynamics (C) 2nd Law of Thermodynamics (D) 3th Law of Thermodynamics

(4). H_2O at 25℃ (77F) and atmospheric pressure is considered to be: (A) a superheated vapor (B) a subcooled liquid (C) a saturated liquid (D) a critical liquid

(5). Steam is accelerated as it flows through an actual adiabatic nozzle. The entropy of the steam at the nozzle exit will be: (A) greater than the entropy at the inlet (B) equal to entropy at the inlet (C) less than the entropy at the inlet (D) zero

(6). What are the metric units of pressure? (A) Watts per square meter (B) Watts (C) Pascals per square meter (D) Newtons per square millimeter(E) Pascals

(7). What is the value in Kelvin of -40 C? (A) -40K (B) 313K(C) 233K(D) 273K(E) Freezing point, 0 K (zero K)

(8). If atmospheric pressure is 0.1013 MPa, what is the absolute pressure of a tank on which a bourdon gage reads -35 Kpa? (A) 351 Kpa (B) 136.3 Kpa (C) 35.1013 Kpa (D) 66.3 Kpa (E) None of these

(9). Which units are equivalent to Watts? (A) 1 Watt = 1 N · m/Sec^2 (B) 1 Watt = 1 kg · m/Sec^2 (C) 1 Watt = 1 N · m/Sec (D) 1 Watt = 1 kg · m/Sec (E) 1 Watt = 1 J/Sec^2

(10). Which units are equivalent to Joules? (A) 1 Joule = 1 N · m/Sec^2 (B) 1 Joule = 1 kg·m^2/Sec^2 (C) 1 Joule = 1 N·m (D) 1 Joule = 1 kg·m/Sec (E) 1 Joule = 1 Watt /Sec^2

2. Please give definition of processes: (30%)
(1)Isobaric (2)Isothermal (3) Isentropic (4)Isometric (5)Adiabatic (6) Throttling (7)Free expansion (8)Polytropic (9)Reversible (10)Quasistatic

3. The Carnot cycle (to initiate steam-engine operation) roughly consists of four steps. Describe how it works. (10%)

4. Describe First Law and Second Law of Thermodynamics. (10%)

5. A water cooled compressor has refrigerant entering as saturated vapor at -30°C. The refrigerant leaves the compressor at 800 kpa. The refrigerant flow rate is 0.9 kg/min and the cooling water results in a heat transfer rate of 140 kJ/min from the refrigerant. The power input to the compressor is 3kW. Determine the exit temperature of the refrigerant. (20%)

For refrigerant: T = -30°C, h_g = 174.076 kJ/kg

Superheated refrigerant table:

800 kpa : Temp. (°C)	h (kJ/kg)
40	205.924
50	213.290
60	220.558
70	227.766