國立雲林科技大學
100學年度碩士班暨碩士在職專班招生考試試題

系所：機械系
科目：機械製造

1. 從材料加工成形機理來分析，材料加工可分爲哪三類？請分別簡述此三類加工法及舉例各有哪些典型加工方法？ (15%)

2. 奈米科技是指在奈米尺度(1-100nm)上研究物質的特性和相互作用。當材料結構小到奈米尺寸時，請說明有哪些效應造成奈米材料具有與普通材料不同的特異性能。 (10%)

3.

(a) Define the modulus of elasticity (Young's modulus) for a metal. (5%)

(b) Define the yield strength for a metal or alloy as used in engineering design. (5%)

(c) How is the yield strength (0.2 percent offset) determined from the engineering stress-strain diagram? (5%)

(d) What is meant by toughness? How does it differ from strength? (10%)

國立雲林科技大學 系所：機械系
100學年度碩士班暨碩士在職專班招生考試試題 科目：機械製造

4. Please draw the setup of the electrochemical machining (ECM) process and describe the principle of operation. (10%)

5. Please draw the setup of the electro-discharge chemical machining (EDM) process and describe the principle of operation. (10%)

6. Please describe the definitions of surface roughness below and the principle of operation of optical interference microscope for the measurement of surface roughness. (20%)

(a) Arithmeric Mean Value ($R_a$)
(b) Root-Mean-Square Roughness (*RMS*)
(c) Maximum Roughness Height ($R_t$)

7. In IC fabrication, photolithography is a main step to define the dimension of transistors. Please describe the process of pattern transfer by photolithography. (10%)