國立臺灣科技大學
九十一學年度碩士班招生考試試題

系所組別： 機械工程系乙組
科　目： 製造學

本試卷共有七大題，合計 100 分。請依序作答

1. 請分別說明下列各小題(20%)，每小題各佔 4%。
   (a). MEMS (microelectromechanical system). (b). Nanotechnology.
   (c). Photolithography. (d). Manufacturing Engineering.
   (e). Infiltration.

2. 請說明燒結碳化物(cemented carbide)之製作方法及應用領域。(10%)

3. 請繪圖說明一平板進行深引伸加工(deep drawing)中材料受力狀況。(10%)

4. Why are metals the better conductors of electricity than ceramics and polymers? (3%) What is the dielectric strength of a material? (3%) Please take an example of product or process to explain the function of the dielectric strength in that product or process. (5%) What are the superconductor and semiconductor materials? (3%) Carbon occurs in two forms of engineering and commercial importance: graphite and diamond. Why can the graphite be used as an electrode in the electric discharge machining process, but the diamond not? (3%) Why is the hardness of the diamond much higher than that of the graphite? (3%)

5. Please make a drawing to describe the up milling and down milling operations and their differences. (10%) Please make a drawing to describe the operation of a mill-turn center. (5%) What is Centerless Grinding? Please make a drawing to describe the setup for external centerless grinding and internal centerless grinding respectively. (5%)

6. What is the Physical Vapor Deposition (PVD)? Please make a drawing to describe the setup for vacuum evaporation PVD and sputtering PVD respectively. (5%) What is the Chemical Vapor Deposition (CVD)? Please make a drawing to describe the function of a reactor used in a chemical vapor deposition process. (5%)

7. What is the Electron Beam Machining (EBM)? Please make a drawing to describe the electron beam machining process. (5%) What is the Electrochemical Machining (ECM)? Please make a drawing to describe the electrochemical machining processes. (5%)