

國立臺灣科技大學

九十二學年度碩士班招生考試試題

系所組別：機械工程系碩士班乙組

科目：製造學

本試卷共有八大題，合計 100 分。請依序作答。

1. 請說明下列各小題 (共 20%): (a) Glass-ceramics (4%). (b) High-speed steel (4%). (c) Phase diagram (4%). (d) Cermet (4%). (e) Investment casting (4%).
2. Please name five examples of using laser in manufacturing. (10%)
3. In plastic manufacturing, injection molding is a very important approach in mass production. Taiwan is also famous in making precision molds. Please describe the considerations in injection mold design and explain what manufacturing processes may be involved to fabricate these molds. (15%)
4. Temperature usually plays an important role in manufacturing. Please describe the temperature's contributions in manufacturing in terms of (1) metal forming, (2) powder metallurgy, and (3) material property enhancement. (12%)
5. Taiwan used to be the number one manufacturer of golf clubs. A driver usually consists of three components—head (Titanium alloy), shaft (Graphite FRP, one of the composite materials), and grip (Rubber). For the given materials, please explain what processes are used to manufacture each component in mass production. (15%)
6. In microfabrication, please give brief descriptions of 3 processes in layer addition and 2 processes in layer removal. (10%)
7. CAD/CAM is very important in manufacturing. What are the three major players (give the names of the CAD software) in today's high-end CAD market? These companies are targeting themselves not only as a CAD provider, but also a PLM (Product Lifecycle Management) solution provider. What is PLM? (8%)
8. CMM is one of the sensing methods in advanced measurement and inspection technology. What is CMM and how does it work? What are the advantages of using CMM over manual inspection methods? (10%)

