

國立台灣科技大學九十五學年度碩博士在職專班招生試題

系所組別：機械工程系碩士在職專班、機械工程系碩士在職專班高職教師組
 科目：機械工程實務

題目共有 10 題，每題 10 分，總分 100 分

簡答題:可用中文或英文回答，答卷須註明題號 (70%)

1. 有一零件欲以粉末冶金方式製作，在零件設計與製作時需注意哪些事項？如果要增加粉末冶金零件之密度，有哪些製程或方法可達到此一目的？ (10%)
2. 一般用於沖壓、鍛造、及擠製加工等之模具材料需具備哪些特性？常用之模具材料又有哪些？請列舉說明之。 (10%)
3. 管材可分成無縫管及焊接管等，請簡略說明這兩種管材之成形加工方式。 (10%)
4. 在製造領域中製程規劃(Process Planning)所包含之工作項目有哪些？請說明之。 (10%)
5. 請說明工業材料(Industrial Materials)之金屬(Metal)、塑膠(Plastics)及陶瓷(Ceramics)在材料結構之差異。 (10%)
6. 請繪圖說明塑膠保特瓶之製作流程，並請說明保特瓶材料(PET)是否可回收？通常回收後處理步驟為何？ (10%)
7. CNC 綜合加工中心(Machining Center)一般是應用伺服馬達與導螺桿(Leadscrew)驅動運動軸，請說明運動軸背隙(Backlash)形成原因及如何補償。 (10%)

翻譯：請將下列三段短文譯為中文 (30%)

8. Several lithographic technologies are used in semiconductor processing: (1) photolithography, (2) electron lithography, (3) x-ray lithography and (4) ion lithography. As their names indicate, the differences are in the type of radiation used to transfer the mask pattern to the surface by exposing the photoresist. (10%)
9. The nontraditional machining (NTM) processes can be divided into four groups based upon the material removal mechanism: (1) Chemical— chemical reaction between a liquid reagent and the workpiece resulting in etching, (2) Electrochemical— an electrolytic reaction at the workpiece surface responsible for material removal, (3) Mechanical— high velocity abrasives or liquids to remove material, and (4) Thermal— high temperatures in very localized regions to evaporate material. (10%)
10. Many experts believe that hydrogen, wind and solar power will provide most of the world's energy in the coming 50 years, with fossil fuels playing a smaller role. The futurologists at Ford and GM all agree that when oil runs out, hydrogen is likely to be the fuel of vehicles. The internal combustion engine will give way to clean electric motors run on hydrogen-fuel cells. Besides powering cars and buses, fuel cells are used to provide power for orbiting spacecraft. Giant fuel cells get larger all the time and may one day power entire cities. (10%)

