

國立虎尾科技大學 103 學年度第二學期博士班資格考試題

所別：動力機械系機械與機電工程博士班

第 1 頁 共 1 頁

科目：機械製造

注意事項：

- (1) 本試題共有 6 題，全部作答，合計一百分。
- (2) 請依序作答於答案卷上並註明題號，若未註明選答題號及超過規定題數時，謹採計作答順序較前之題目計分。
- (3) 可使用計算機，close book。

1. What is ductility, and how is it measured? (10%)
2. In the stress-strain curve equation $\sigma = K \varepsilon^n$, what does the exponent n signify? What does it behave when $n = 0$ and $n = 1$? (15%)
3. What are the elements of a gating system of a casting pattern? (15%)
4. Please name and simply describe five kinds of major weld defects. (10%)
5. The engineering load-strain diagram shown in the Fig.1 was obtained from a tensile test on a specimen having an initial diameter of 12.0 mm. The diameter of fractured neck at point 2 was 6.25 mm. (i) Determine the true stress σ (Mpa) and true strain ε at point 1 and 2. (ii) Determine the value of the parameters n and K of the relationship $\sigma = K \varepsilon^n$. (25%)
6. A wire is drawn through a conical die shown as Fig.2-1 and Fig.2-2. If the friction is neglected. It is reduced from the initial diameter d_0 of 11 mm to the final diameter d_1 of 6 mm. If the yield strength formula is $Y = Y_0 + K\varepsilon = 280 + 320\varepsilon$, $v_d = 4\text{mm/sec}$, $\rho c = 3.7(\text{N/mm}^2\text{°C})$. Determine ε_1 , $Y_0(\text{N/mm}^2)$, $Y_1(\text{N/mm}^2)$, $F_d(\text{N})$, and the drawing power $P(\text{kW})$. (25%)

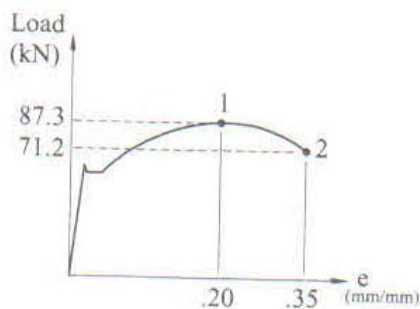


Fig.1

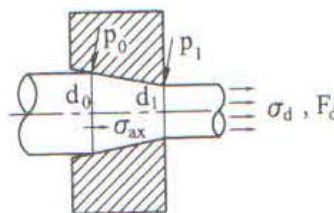


Fig.2-1

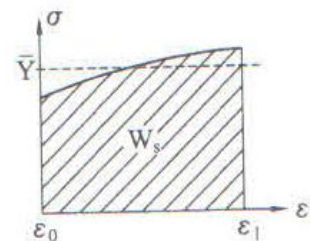


Fig.2-2