

國立臺灣科技大學

九十一學年度碩士班招生考試試題

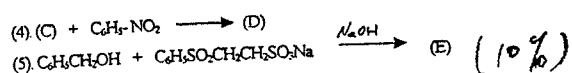
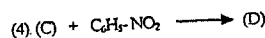
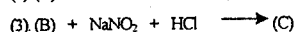
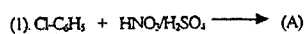
系所組別：纖維及高分子工程系在職專班

科目：纖維及高分子工程實務

總分 100 分

1. If a wet sheet in a dryer loses its moisture at a rate proportional to its moisture content, and if it loses half of its moisture during the first 10 minutes, when will it be practically dry, say, when will it have lost 99% of its moisture? (10%)

2. 試完成下列反應：



3. 纖維用螢光染料乃用 1 分子 4,4'-DIAMINO STILBENE- 2,2' DISULPHONIC ACID

及 2 分子 CYANURIC CHLORIDE 縮合而成。請試將此合成的反應物及生成物

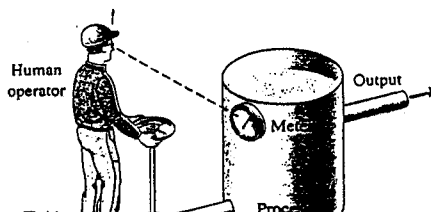
之結構式畫出。 (10%)

4. The thermal surroundings are at a temperature ΔT above that of a system to which they are delivering thermal energy. The extent to which this energy transfer is an irreversible process can be judged by the entropy change for the transmittal of, say, 1 kJ of the thermal energy. Please answer the following questions: (10%)

(a) What is this entropy change for this system, the surroundings and the universe if ΔT is 1°C and the system is at 25°C ? (5%)

(b) What is the entropy change if ΔT is 0.01°C and the system is still at 25°C ? (5%)

5. What are open-loop control systems and closed-loop control systems? A manual control system for regulating the level of fluid in a tank by adjusting the valve is shown in the figure. The operator views the level of fluid through a meter in the side of the tank. Sketch the block diagram of the human-operated fluid-level control system, and indicate that the control system is an open-loop control system or a closed-loop control system. (10%)



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6. 試述紡製"低光阻" polymethylmethacrylate (PMMA) 光纖之重要合成、加工與紡絲流程技術?(15%)
7. 寫出 Indigo 染料之染色過程。(10 分)
8. 紡紗過程中毛羽的產生對產品品質及織造效率影響甚大，試就紡紗三角理論說明毛羽成因，並根據此理論舉兩個實例說明如何減少紗線毛羽的發生(10 分)。
9. 試就合成纖維之導電化技術提出說明，並分別就導電率之範圍與工業應用之關係 (B) 導電率之測試方法，予以闡述。(15%)

