

國立勤益技術學院九十四學年度研究所碩士班招生筆試試題卷

所別：材料與化工所

組別：材料科技組

身分別：一般生

科目：高分子科學

准考證號碼：□□□□□□□□

(考生自填)

考生注意事項：

- 一、考試時間 100 分鐘。
- 二、可使用不具備翻譯功能之計算機
- 三、本試題共八大題

試題一：< 10 分 >

In your own words, explain the difference between (a) SEM and TEM. (5 pts) (b) DSC and DTA. (5 pts)

試題二：< 5 分 >

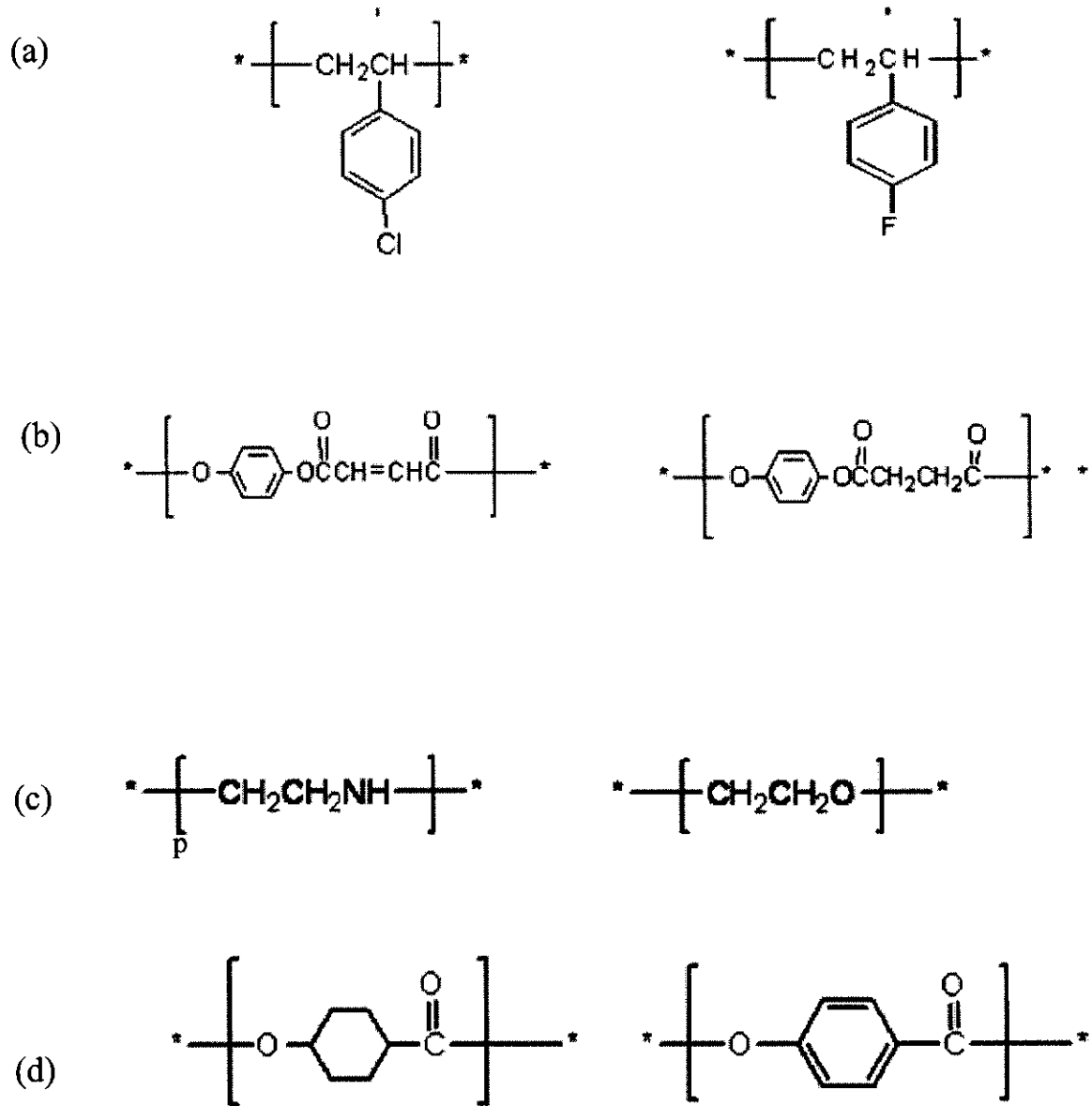
Increasing temperature in general reduces the viscosity of polymer solutions. How might the magnitude of this effect compare in a “poor” solvent and a “good” solvent?

試題三：< 10 分 >

Draw a modulus versus temperature curve and define the five regions of viscoelastic behavior of an amorphous polymer.

試題四：< 20 分 >

Which polymer in each of the following pairs would you expect to exhibit the higher glass transition temperature? Explain your choice in each case. (each 5 pts, total 20 pts)



試題五： < 10 分 >

Define the viscosity of polymer flow. (5 pts) What are the factors that affect it? (5 pts)

試題六： < 15 分 >

If one were to react 50.0g of terephthalic acid (TPA) (1,4-benzenedicarboxylic acid) with 20.0g of ethylene glycol, how many grams of TPA would have to be consumed in order to obtain a degree of polymerization of 20?

試題七： < 15 分 >

Calculate \overline{Mn} and \overline{Mw} for a hypothetical polymer sample that contains the same mole of polymer having molecular weights of 1.25×10^6 , 1.35×10^6 , 1.50×10^6 , 1.75×10^6 , 2.00×10^6 .

試題八： < 15 分 >

A polymeric material has a relaxation time of 100 days at 27°C when a stress of 4.0 MPa is applied.

- (a) How many days will be required to decrease the stress to 3.2 MPa?
(7 pts)
- (b) What is the relaxation time at 40°C if the activation energy for this process is 20 KJ/mol? (8 pts)