

國立屏東科技大學 109 學年度 碩士班暨碩士在職專班 招生考試
食品科學系碩士班 食品化學試題

- 一、何謂水活性？(5%) 請從食品化學的觀點說明水活性與食品品質的關係。(15%)
- 二、請寫出四種用來判定油脂劣變的指標，並說明上述指標產生的原理和理由。(20%)
- 三、請說明氣相層析法(Gas chromatography)與高效能液相層析法(High performance liquid chromatography)之原理差異處，及這兩種方法在食品分析上有何應用？(20%)
- 四、請說明蛋白質的一級、二級及三級結構。(10%)
- 五、請說明 amylose, amylopectin 及 cellulose 之結構差異。(10%)
- 六、請解釋下兩段原文的意思。
1. Reports of the presence of acrylamide in a range of fried and oven-cooked foods have caused worldwide concern because this compound has been classified as probably carcinogenic in humans. Here we show how acrylamide can be generated from food components during heat treatment as a result of the Maillard reaction between amino acids and reducing sugars. We find that asparagine, a major amino acid in potatoes and cereals, is a crucial participant in the production of acrylamide by this pathway. (10%)
 2. The chemical composition and the contents of resistant starch and soluble and insoluble dietary fiber of pea (*Pisum sativum* L.), common bean (*Phaseolus vulgaris* L.), chickpea (*Cicer arietinum* L.) and lentil (*Lens culinaris* Med.) legumes, were studied. Raw and freeze-dried cooked samples were used, both in the form of flour. Protein values of the legumes ranged from 18.5 to 21.9 g/100 g for the raw grains and from 21.3 to 23.7 g/100 g for freeze-dried cooked legumes. Chickpea stood out for the highest lipid content ($p < 0.05$), the lowest insoluble fiber values, and soluble dietary fiber not detected. The average content of resistant starch found in the legumes did not differ statistically ($p > 0.05$), being 2.23 ± 0.24 g/100 g for freeze-dried cooked legumes, and showing a slight reduction in comparison to the raw form. (10%)