

國立成功大學
110學年度碩士班招生考試試題

編 號： 178

系 所： 電機工程學系

科 目： 資料結構

日 期： 0202

節 次： 第 2 節

備 註： 不可使用計算機

※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. For a two dimensional array A , if the location of $A(4,3)$ is 1000 and $A(3,5)$ is 1013. Assume that each element occupies 1 address. What is the location of $A(2,2)$? (10 %)

2. Which of the choices DO NOT contain two equivalent expressions? Note that A^B is A^B . (15 %)

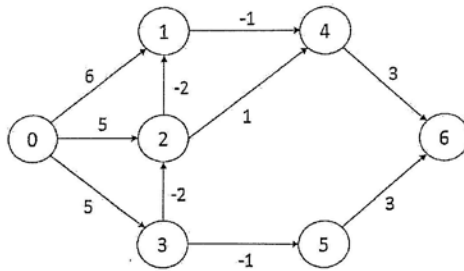
(a) Infix	$A+B-C$	Prefix	$-+ABC$
(b) Postfix	$AB+CD-*$	Prefix	$*+AB-CD$
(c) Postfix	$AB^C*D-EF/GH+/+$	Prefix	$+-*^ABCD//EF+GH$
(d) Postfix	$AB+C*DE--FG+^$	Prefix	$^-*+ABC-DE+FG$
(e)	None of the above		

3. Read the following data in the given order: (30 %)

55, 45, 25, 35, 85, 95, 65, 75, 105, 15

(a)	If you create a max heap for them, what will be the value in root?	(10 %)
(b)	If you create a 2-3 tree for them, what will be the value in root?	(10 %)
(c)	If you create an AVL tree for them, what will be the value in root?	(10 %)

4. Use the Bellman-Ford algorithm, **STEP BY STEP**, to find the shortest path and the length from node 0 to node 6 in the following graph. Note that you get 0 point without showing the result after each step. (15 %)



5. Consider the merge sort and quick sort. Let L_1 and L_2 be two sorted lists of m and n elements, respectively. (15 %)
- (a) What is the maximum number of comparisons needed for merging L_1 and L_2 ? (5 %)
 - (b) What is the minimum number of comparisons needed for merging L_1 and L_2 ? (5 %)
 - (c) Both merge sort and quick sort are suitable for external sorting. Right? Explain your answer. (5 %)
6. Describe three key points for designing a good hashing function. (15 %)