

# 淡江大學 102 學年度日間部轉學生招生考試試題

系別：資訊工程學系三年級

科目：資訊概論

考試日期：7月24日(星期三) 第3節

本試題共8大題，2頁

本試題雙面印刷

- Let two bit patterns  $A = (11011101)$  and  $B = (00010100)$ .
  - Use the logical right shift on the bit pattern A and the circular left shift on the bit pattern B. (2%)
  - Use the XOR operator on those two bit patterns A and B. (2%)
  - If A and B are stored in two's complement format, show how  $A - B$ . (3%)
  - If we need to unset (force to 0) the four leftmost bits of a bit patterns, show the mask and the operation. (3%)

- Using the selection sort algorithm, manually sort the following list and show your work in each pass using a table. (10%)

14	7	23	21	31	40	56	78	9	2
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- You have the relations COURSES and TAUGHT-BY shown below.
  - Show the resulting relations if you apply the SQL statements: `Select * from COURSES where UNIT=5.` (10%)
  - Show the resulting relations if you apply the SQL statements: `Select No, Course-name, Unit, Professor from COURSES, TAUGHT-BY where COURSES.No= TAUGHT-BY.No.` (10%)

COURSES			TAUGHT-BY	
No	Course-Name	Unit	No	Professor
CIS15	Intro to C	5	CIS15	Lec
CIS17	Intro to Java	5	CIS17	Lu
CIS19	UNIX	4	CIS19	Walter
CIS51	Networking	5	CIS51	Lu
CIS52	TCP/IP	6	CIS52	Lec

- Show the content of stack S1 and the value of variables x and y after the following algorithm segments is executed. (10%)  
`Stack(S1); push(S1, 5); push(S1, 3); push(S1, 2);`  
`If (not empty(S1)) pop(S1, x);`  
`If(not empty(S1)) pop(S1, y);`  
`Push(S1, 6)`
- Find the Huffman tree for the following characters using Huffman coding with the given frequencies: A(12), B(8), C(9), D(20), E(31), F(14), G(8). (15%)
- Multiple Choice Questions (10%)
  - If the memory address space is 16MB and the word size is 8 bits, then \_\_\_\_\_ bits are needed to access each word.
    - 8
    - 16
    - 24

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- (d) 32
- (2) In the \_\_\_\_\_ method for synchronizing the operation of CPU with the I/O device, a large block of data can be passed from an I/O device to memory directly.
- (a) programmed I/O
  - (b) interrupt-driven I/O
  - (c) DMA
  - (d) Isolated I/O
- (3) \_\_\_\_\_ is a protocol for accessing and transferring documents on the WWW.
- (a) FTP
  - (b) SMTP
  - (c) MINE
  - (d) HTTP
- (4) In \_\_\_\_\_, the program can be divided into equally sized sections called pages, but the pages need not be in memory at the same time for execution.
- (a) partitioning
  - (b) paging
  - (c) demand paging
  - (d) demand segmentation
- (5) The \_\_\_\_\_ layer of the TCP/IP protocol suite is responsible for node-to-node delivery of a frame between two adjacent nodes.
- (a) transport
  - (b) network
  - (c) data-link
  - (d) session
7. Show your work to draw the binary search tree whose elements are inserted in the following order: 50, 72, 96, 107, 26, 12, 11, 9, 2, 10, 25, 51, 16, 17, 95. (15%)
8. Show that a heap storing  $n$  entries has height  $h = \lfloor \log n \rfloor$  (10%)