招生學年度	101	招 生 類 別	碩士班
系 所 班 別	運籌管理研究所碩士班(甲組)、資訊管理碩士學位學程		
科 目	計算機概論		
注 意 事 項	本考科禁止使用掌上型計算機		

Note: You must write down the process of calculation or reason! Otherwise, you will get 0 score for each question.

1. A computer system uses 1 byte to store a decimal number. **(15%)**
   (a) Use 2's complement to express -30.
   (b) Use 2's complement to express -50.
   (c) Use 2's complement to perform -30-50.

2. What is the difference between lossless and lossy data compression? **(5%)**

3. Convert the following numbers from the base shown to base 10. **(10%)**
   a. 111 (base 2)
   b. 777 (base 8)
   c. FEC (base 16)
   d. 777 (base 16)
   e. 111 (base 8)

4. (a) Please build a binary search tree (BST) using the following strings: john, phil, lila, kate,becca, judy, june, mari, jim, sue. **(5%)**
   (b) According to the answer of (a), please list the preorder traversal of the tree. **(5%)**
   (c) According to the answer of (a), please list the inorder traversal of the tree. **(5%)**
   (d) According to the answer of (a), please list the postorder traversal of the tree. **(5%)**

5. If the page map table for a process A is the following:

Page	Frame
0	5
1	12
2	15
3	7
4	22

   If process A is running and needs logical address 2012, how is the actual address calculated? (We assume that a frame and a page are 1024) **(5%)**

6. If the memory block for a computer system is the following

A: 1000	B: 700	C: 750	D: 1500	E: 300	F: 350

   Requests come in for blocks of the following sizes: 1000, 25, 780, 1600, 325. What block will be assigned to each request if the (Treat each request as an independent event)
   (a) First-fit algorithm is used? **(5%)**
   (b) Best-fit algorithm is used? **(5%)**
   (c) Worst-fit algorithm is used? **(5%)**

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7. Given the following Huffman encoding table, decipher the bit strings below.

Huffman Code	Character
00	A
11	E
010	T
0110	C
0111	L
1000	S
1011	R
10010	O
10011	I
101000	N
101001	F
101010	H
101011	D

a. 1101110001011 **(4%)**
b. 0001111001010101000 **(4%)**
c. 011010101010010101111111000 **(4%)**
d. 10100100101000010001000010100110110 **(4%)**
e. 10100010010101000100011101000100011 **(4%)**

8. Distinguish between Internet and Web. **(10%)**