

CS 2412 MID TERM EXAMINATION

Oct.30, 2000

Duration: one hour

Name:

Student Number:

Grade:

Note. There are total 5 problems in this exam set (5 pages).

Problem 1. (10 marks)

Indicate which of the following statements are correct:

- (a) Stack is FIFO (b) Stack is FILO (c) Queue is LILO
(d) Queue is LIFO (e) List is LILO (f) List is LOLI

The correct statements are:

Problem 2. (20 marks)

Assume $A = 1$, $B = 2$, $C = 3$. Evaluate the following postfix expressions. If some expression is invalid, then just answer: invalid. You might write down the detailed solutions for partial marks in case you get wrong answers.

$$AB+AC+*B+C*$$

Answer:

$$ABC*+AB+*BC*-$$

Answer:

$$AB*-CAB-+A*$$

Answer:

$$AB*C-A*B-C*AB*+$$

Answer:

Problem 3. (20 marks)

What is the output of the following segment of a programs?

Segment 1.

```
int a[][2]={1,2},{3,4},{5,6},*pi,b[2],i;
pi=a[1];
for (i=0;i<2;i++)
b[i]=*(pi+i);
pi=&a[0][0];
*pi=b[0];
printf("%d,%d,%d\n",a[0][0],a[0][1],a[1][0]);
```

The output is:

Segment 2.

```
typedef struct
{ char name[6];
  int id;
} STUDENT;
STUDENT s1={"Jone",25535},s2={"Mary",12345}, *sp;
sp=&s2;
sp->id=15550;
sp=&s1;
s2.id=sp->id;
printf("%s:%d %s:%d\n",s1.name,s1.id,s2.name,s2.id);
```

The output is:

Problem 4. (25 marks)

Write a C function `freelist` which will destroy a linear linked list (implemented by dynamic variables), i.e., it frees all the nodes of that list. You can assume that the information field of each node in the list contains an integer and that all the structures and functions discussed in class are available.

Problem 5. (25 marks)

Suppose `list1` is a list. Write an algorithm to delete every second element from this list and put the data of information field of these deleted nodes into another list `list2` in reverse order. You can use the operations discussed in the class.