1. Please answer the following questions about LR parsing method.
   (a)What is the model of LR parser? (5%)
   (b)What is the difference among the following three methods: SLR, LALR, and LR(1)? (5%)
   (c)What is the following grammar, SLR, LALR, LR(1), or not in them? Why?

   S → L = R
   S → R
   L → *R
   L → id
   R → L (5%)

2. Please answer the following question about the run time memory allocation.
   (a)What is the activation record? (5%)
   (b)What is the content of the activation record of a blocked structure language? (5%)
   (c)Please show the memory layout at LABEL A for the following program.

```
Proc main
 proc  P
    proc  R
       begin
          LABEL  A:
          ...
       end
    begin
       R();
    end
 proc  Q
    begin
       P();
    end
 begin
    Q();
 end.
```

(5%)

   (d)The following grammar can be used to describe the syntax of the above program in (c).

```
proc-decl  →  proc-head  proc-decl  proc-body
           |  proc-head proc-body
```

(背面仍有題目,請繼續作答)

proc-head → PROC id()
proc-body → BEGIN stmts END
Please give the semantic translation schema for counting the nest level number of each procedure and generating the code for allocating the required activation record. (10%)

3. (a) If the value of a counting semaphore equals N, what is the meaning of N in terms of the critical-section problem ? (5%)
   (b) As you know, *wait* and *signal* operations are applied to manipulate the value of a semaphore. Give the corresponding operations in the operating system that you are familiar with (such as Unix). (5%).

4 Please use "yes", "no", or an integer value to answer the following questions for paging and segmentation systems respectively. (10%)
   (a) Need the programmer be aware that this technique is being used ?
   (b) How many linear address spaces are there ?
   (c) Can procedures and data be distinguished and separately protected ?
   (d) Can tables whose size fluctuates be accommodated easily ?
   (e) Is sharing of procedures between users facilitated ?

5. (a) List those factors that determine the minimum number of frames in avoiding a high page fault (5%)
   (b) Draw an inverted page table and briefly describe its advantages and disadvantages. (5%)

6. (a) List all the possible methods of allocating disk space to files. (5%)
   (b) Explain the concept of hard link and soft link in Unix file system. (5%)

7 Describe advantages and disadvantages of IPC methods of using shared-memory and message-passing. (You must first illustrate their concepts and then compare them in terms of implementation difficulty, easy-to-use, etc.) (10%)

8. (a) Compare Macro and Subroutine in terms of memory space and binding time (5%)
   (b) Compare the single-pass and two-pass macro processor. (5%)