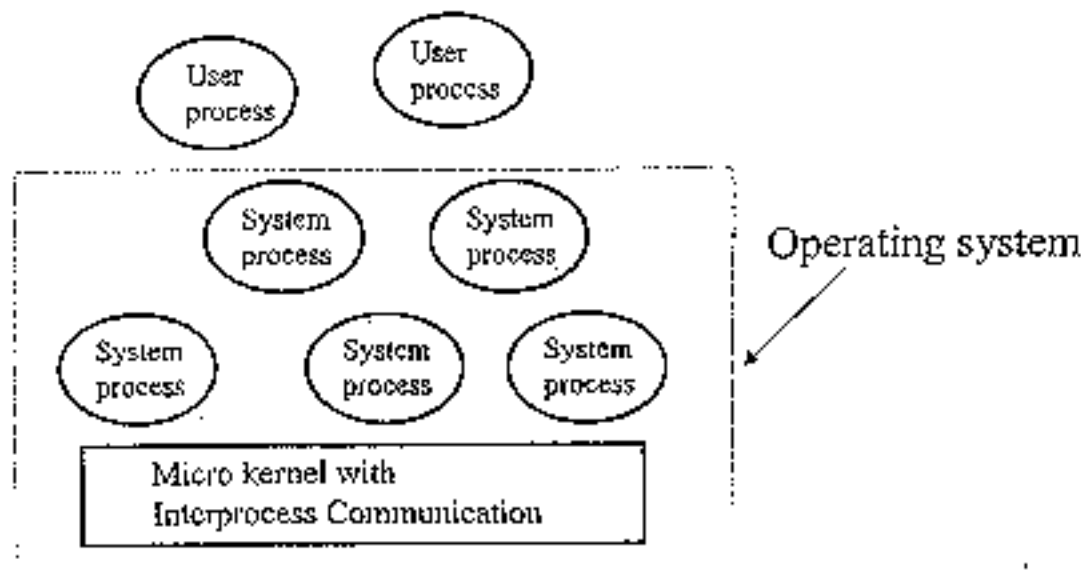
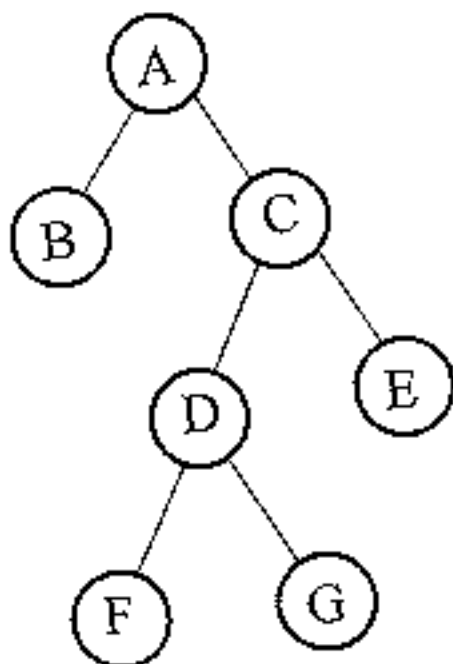


- [1] Write a regular definition to represent unsigned numbers in Pascal such as 5280, 39.37, 633.6E4 or 1.894E-4. (9%)
- [2] Consider the grammar  $S \rightarrow aSbS \mid bSaS \mid \epsilon$  (15%)
- Show that this grammar is ambiguous by constructing two different leftmost derivations for the sentence abab.
  - Construct the corresponding rightmost derivations for abab.
  - Construct the corresponding parse trees for abab.
- [3] What are the *shift/reduce* conflict and *reduce/reduce* conflict in bottom-up parsing?(8%)
- [4] 試畫出 process state diagram, 就下列各事件 (events), 可能導致的 process state transition 作說明, 並標示在 process state diagram 中. (12%)
- time slice expires
  - I/O completion
  - A Signal(semaphore) operation executed, the semaphore value becomes -2
  - A Signal(semaphore) operation executed, the semaphore value becomes +2
  - A Wait(semaphore) operation executed, the semaphore value becomes -3
  - A Wait(semaphore) operation executed, the semaphore value becomes +3
- [5] We can reserve some main memory area as a virtual disk, which can be used as an ordinary disk to store files. In general, the I/O system for file service in a computer includes file system, cache manager and disk driver. To support virtual disk I/O service, what would be the required system components? (Please show the system structure with a diagram) What are the functions of each system component? (15%)
- [6] For a micro-kernel based operating system as shown below, please describe the detailed mechanism (how the control is passed among each software module) of a system call. What are the main disadvantages using such approach (in comparison with large kernel approach)? (15%)



(背面仍有題目,請繼續作答)

- [7] Please draw a diagram and explain the concept and its applications of an indexed sequential file. (10%)
- [8] For a binary tree shown below, please use an array to represent this binary tree. Only the information field (no pointers or link fields) is included in each element of the array. Please show this array to represent the binary tree and explain it briefly. (8%)



- [9] In a computer supporting virtual memory, the concepts of virtual address space and real address spaces will exist. (8%)
- [9-1] In such a system, the assembler would assign addresses to variables during assembling programs, the addresses assigned would refer to
- addresses in the real address space
  - addresses in the virtual address space
  - the two answers above would both be possible
- [9-2] In such a system, the linker would do address relocation during linking programs, the addresses modified would refer to
- addresses in the real address space
  - addresses in the virtual address space
  - the two answers above would both be possible

\*\*\*\*\* Note: Please choose the best answer and explain briefly. \*\*\*\*\*