本試題是否可以使用計算機：　□可使用　，　☑不可使用　　（請命題老師勾選）

注意事項：
1. 本試題除各題另有限制之外，可使用 Pseudo Code，Java、C 或 C++作答。
2. 請依題號序作答於答案紙。作答時可不必抄題，但請務必將各題之完整題號(例：*(1-A)* 或*(2-B)* 等等)標示清楚。
3. 本試題共計二頁。配分標示於各題或各小題。不可使用電子計算機。

1. What is program relocation? What kind of information is needed for program relocation? How does it work?(10%)

2. What are the main functions of an operating system? (10%)

3. Use an example to explain how a segment-page virtual memory system works. (10%)

4. In a function invocation, what kinds of data are arranged in the activation record by the compiler ? (10%)

5. What is the "deadlock" problem in an operating system? Give an example to explain it. How does an operating system detect the deadlock and solve the problem? (10%)

6. Explain the following terms: (3 points each)

   (1-a) Asymptotic notation　*(1-b)* Sentential form　　*(1-c)* Radix sort

   (1-d) COFF　　　　　　　*(1-e)* Threaded binary tree　*(1-f)* Lexical analyzer

共二頁

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7. For each of the following statements, indicate TRUE or FALSE. (1 points each)

   (2-a) A binary tree can be represented by an adjacency matrix.

   (2-b) A stable sorting algorithm is more efficient than an unstable sorting algorithm in average case.

   (2-c) An AVL tree always has more leaf nodes than non-leaf nodes.

   (2-d) If $f(n) = \Theta(n)$ then $f(n) = O(n)$.

   (2-e) It is always better to implement the symbol table of a compiler using B-tree.

   (2-f) An assembler must use an extra pass to process macros in the program.

   (2-g) The input to absolute loader must be object program generated by compiler.

   (2-h) The Java Virtual Machine (JVM) is the interpreter for Java program.

   (2-i) A compiler using LL(1) parsing method is a one-pass compiler.

   (2-j) When compiling the source program, a compiler never sees non-terminals.

8. Please compare the advantages and disadvantages of quick sort and merge sort. (5 points)

9. When can program linking be done? (3 points)
   Please compare the advantages and disadvantages. (5 points)

10. In C programming language, why the statement

    a = b = c = d;

    is evaluated from right to left rather than left to right? (5 points)

11. Please compare the difference between compiler and interpreter. (4 points)