

每題 20 分:

1. State the differences and applications between the recursive algorithm and the iteration algorithm. Is it possible to use an iteration algorithm to implement a recursive algorithm? Is the converse true? (Use an example to explain).
2. Following is an algorithm coded with the algorithmic language:

```
ALGORITHM Test
DECLARE A, S: integer
EXECUTE A ← 10
        S ← F(A)
        OUTPUT A, S
END Test

FUNCTION F(k): integer
DECLARE k: integer
EXECUTE WHILE k > 0 DO k ← k - 1
        F ← k
END F
```

- What are the results of the function call when the parameters are passed by reference (or address) and when the parameters are passed by value, respectively?
3. State the common methods in order to represent an integer for a computer. What are the advantages and the disadvantages for these different representing methods?
 4. How does the computer system in adding two numbers, internally?
 5. What are the record and the field of a file? What are the basic concerns in updating an old master file from a transaction file in sequential file processing and in random file processing, respectively?