1. What is the function of the central processing unit? 10%

2. Distinguish between compliers and interpreters. 10%

3. How distinguishes multiprogramming from multiprocessing and distributed processing? 10%

4. Given an example to explain one way in which WHILE construction can be substituted for a REPEAT construction. 8%

5. For a 6 bit machine, given the binary 101011, what is its decimal value when it in the (i)sign-magnitude representation, (ii)twos-complement representation and (iii)ones-complement representation? 12%

6. Given two four-bit values, (A)1011 and (B)0110. How to isolate the rightmost two bits of each of them by using the operators: AND,OR,SHR(shift right), or SHL(shift left), to combine them into a single four-bit value,(C)1110, where the leftmost two bits of (C) is the rightmost two bits of (A), and the rightmost two bits of (C) is the rightmost two bits of (B). 10%

7. The function FIB is defined by

$$FIB(n) = \begin{cases} 0 & \text{,if } n = 0; \\ 1 & \text{,if } n = 1; \\ FIB(n-1) + FIB(n-2) & \text{,if } n >= 2. \end{cases}$$

Write (i) an iteration algorithm and (ii) a recursion algorithm, to get the function value for a given positive integer n. 20%

8. Using the following partial program:

```
var  k : integer;
     a : array [1..3] of integer;
procedure TestBind(<binding> f,g : integer);
    begin
        g := g + 1;
        f := 5 * k;
    end;
begin
    for k := 1 to 3 do
        a[k] := k;
    k := 2;
    TestBind(a[k],k);
    print(k,a[1],a[2],a[3]);
end.
```

to write the print result of the invoking call TestBind when we use the binding rule by (i) call-by-value, (ii) call-by-address, (iii) call-by-value/result, and (iv) call-by-name. 20%