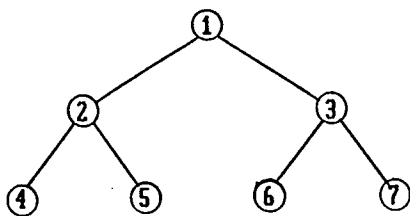每題十分，可用中英文作答.

1. Describe an area of Computer Science (possibly theoretical in nature) that has potential for an application to Personal Computing that does not currently exist. Be specific about how the application would be used, and what its value would be.

2. Should arrays be passed by address or value? Why?

3. Wtite a recursive routine that will read a single line of characters (delimited by a period) and will write the reverse of that string, less the period. (You can use whatever programming language)

4. Give one advantage and one disadvantage to the use of recursion.

5. Define a Translator. List and describe its major phases.

6. Traverse the following binary tree in PREORDER, INORDER and POSTORDER.

7. A half-adder has two binary inputs and two binary outputs. Please
   (1) define the truth table for the half-adder.
   (2) give two different implementations by using the combination of "AND", "OR", "NOT", or "Exclusive-OR" gates.

8. What are the basic subcycles (operations) included in an instruction cycle?

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149

9. What is a fault-tolerant computer system? Please give any three of its
   characteristics?

10. What is the output of the following program?

```
program main;
var x,y:integer;
procedure p1(a:integer);
procedure p2;
begin
a:=2;
writeln('a',x,y,a)
end;
begin
a:=6;
p2
end;
procedure p3(var a:integer);
var x:integer;
begin
x:=12;
a:=24;
writeln('b',x,y,a)
end;
begin
x:=20;
y:=30;
writeln('c',x,y);
p1(x);
p3(y);
writeln('d',x,y)
end.
```