

國立臺北科技大學九十六學年度碩士班招生考試

系所組別：1830 資訊工程系碩士班丙組

第一節 計算機概論 試題

第一頁 共二頁

**注意事項：**

1. 本試題共 20 題，配分共 100 分。
2. 請標明大題、子題編號作答，不必抄題。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

一、簡答題，每題 6 分，共 60 分。

1. What's a semaphore?
2. What's the difference between a repeater and a router?
3. List the bit patterns and the corresponding values represented for an excess eight notation.
4. What's a binary search tree?
5. What's an ambiguous grammar?
6. Prolog is a programming language that is based on first order logic. In Prolog, a program is represented by a set of *facts* (something that is always true) and *rules* (something that allows you to derive new facts from existing facts). For example, Table 1 lists some facts and rules about relationships between members in a family. Note that AND and OR are logical *conjunction* and *disjunction*, respectively.  
Complete the Prolog rule A (marked as **(A)**) and Prolog rule B (marked as **(B)**) for Table 1 using the following definitions: to a person, a brother is a male who has the same mother and father; an uncle is a brother of a parent.

Table 1

type	in Prolog	in English
fact	male(X).	X is male.
fact	female(X).	X is female.
fact	father(X,Y).	X is the father of Y
fact	mother(X,Y).	X is the mother of Y
rule	parent(X,Y) :- father(X,Y) OR mother(X,Y).	X is a parent of Y <b>if</b> X is the father of Y <b>or</b> X is the mother of Y.
rule	grandfather(X,Y) :- father(X,Z) AND parent(Z,Y).	X is a grandfather of Y <b>if</b> X is the father of Z <b>and</b> Z is a parent of Y.
rule A	brother(X,Y) :- <b>(A)</b>	
rule B	uncle(X,Y) :- <b>(B)</b>	

7. Draw an entity-relation (ER) diagram for the following description: **Software developers work on projects, which are ordered by customers. Each software developer works on only one project, but a project may have many software developers working on it. Each project is ordered by one customer, but a customer may order many projects.**
8. Given Relation A and Relation B below, what is the result of executing the following SQL command: **JOIN A and B where A.W = B.X**

V	W		X	Y	Z
r	3		5	g	p
t	4		4	d	e
p	8		3	m	q
			4	t	f
9. The reasoning capabilities within a machine can be achieved through a production system. Describe the three main components of a production system.

注意：背面尚有試題

10. Draw a diagram of the components of the Turing machine. Describe the function for each of the components.

二、解釋名詞，每題 4 分，共 40 分。

1. encryption
2. critical section
3. data abstraction
4. Hamming distance
5. imperative language
6. polymorphism
7. Big theta ( $\Theta$ ) notation
8. waterfall model
9. cohesion
10. Pareto principle in software testing