THE UNIVERSITY OF AUCKLAND

SECOND SEMESTER, 2006
Campus: City

The Practice of Artificial Intelligence

(Time allowed: 45 minutes)

This test is out of **100** marks.
Attempt **ALL** questions.
Write your answers in the space provided in this booklet. There is space at the back for answers that overflow the allotted space.
The use of calculators is **NOT** permitted.

Surname (Family Name):	
First Name(s):	
UoA ID Number:	
Login Name (UPI):	

Section	Mark	Marks Available
A		47
B		10
C		43
Total		100

Continued…

PART A: Knowledge Engineering

Question 1

Describe the difference between *explicit* knowledge and *tacit* knowledge? [5 marks].

Question 2

In knowledge elicitation what would you use structured interviews for? [5 marks]

Question 3

What is meant in Knowledge Engineering by *a contained domain* [5 marks]?

Continued…

Print Name:

Question 4

List four advantages of knowledge level modeling [4 marks].

1.

2.

3.

4.

Question 5

Goal Driven Reasoning and *Data Driven Reasoning* are two inferencing methods for rules, each is commonly used for different problem types. Describe a problem you would use each for. [4 marks].

1. Goal Driven Reasoning is used for…

2. Data Driven Reasoning is used for…

Continued…

Print Name:

Question 6

Create a semantic network to describe borrowing a book from the University library. Your network should include the concepts: *book, library, borrows, reads, returns, & student.*
[12 marks]

Continued…

Print Name:

Question 7

Draw a diagram that describes the architecture of an *Expert System Shell*
[12 marks]

Continued…

Print Name:

PART B: CLIPS

Question 8

Define a CLIPS rule for the following pseudocode [5 marks]

IF the animal is a duck
THEN the sound made is quack

Question 9

What happens if you define two rules in CLIPS both called “duck” [5 marks]

Continued…

Print Name:

PART C: Machine Learning

Question 10

Why do learning algorithms have bias? [5 marks]

Question 11

What is an example of a learning algorithm that has no bias? [3 marks]

Question 12

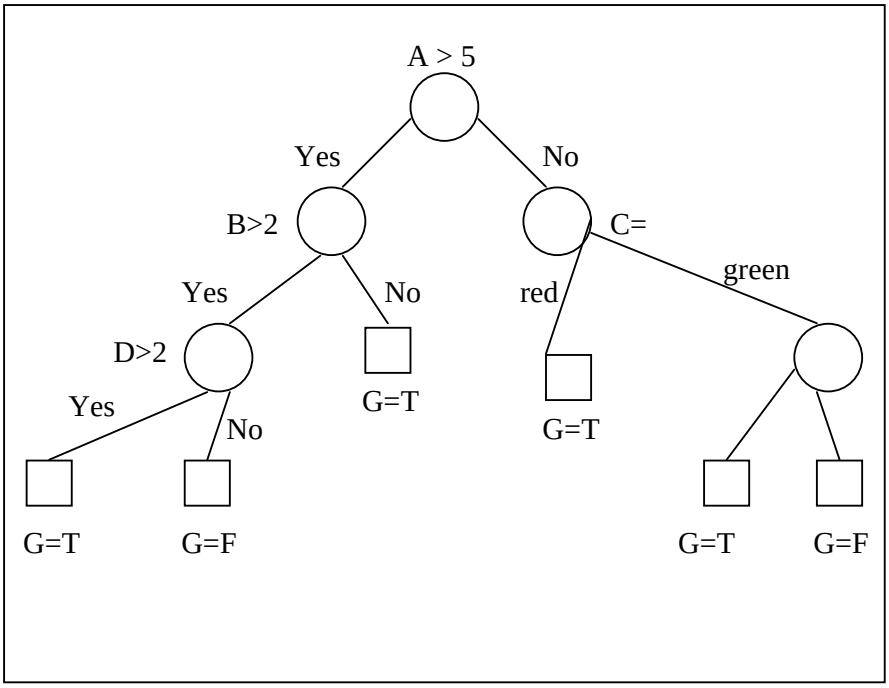
What are the number of hypothesis in this version space? [5 marks]

G = { (?, ?, Blue, ?, ?),
(?, ?, ?, ?, Economy) }
S = { (Japan, Honda, Blue, ?, Economy) }

Continued…

Print Name:

Question 13

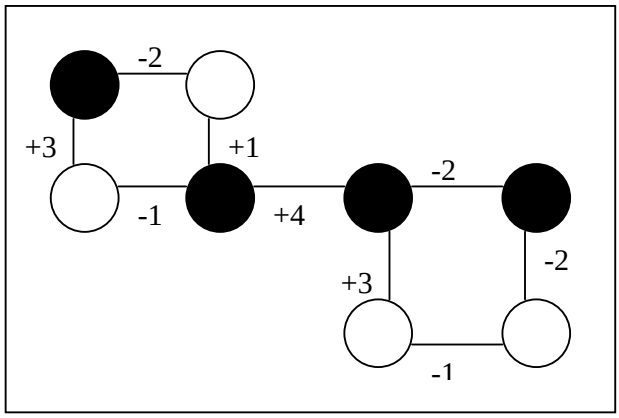


What are the rules that would be produced from this decision tree? [5 marks]

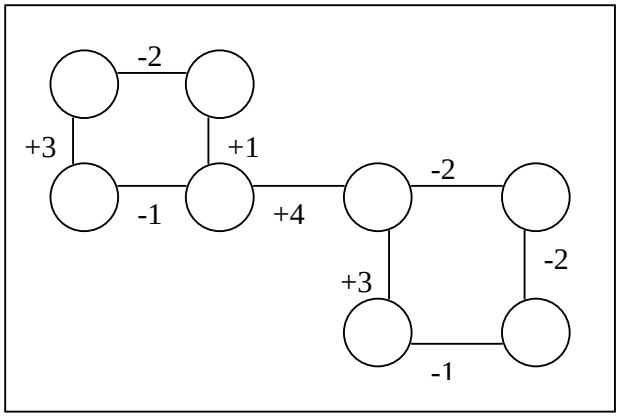
Continued…

Print Name:

Question 14



Given this Hopfield network what would the stable state be? [5 marks]



Question 15

Why does backpropagation use a sigmoid function instead of a step function? [5 marks]

Question 16

Continued…

Print Name:

Will the backpropagation algorithm always find the global optima? Why or why not? [5 marks]

Question 17

What is the difference between bias and variance? [5 marks]

Question 18

What is the difference between sample error and true error? [5 marks]

Continued…

Print Name: _____

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