Ollscoil na hÉireann, Gaillimh
National University of Ireland, Galway

GX 0078

Semester 1 Examinations, 2005

Exam Code(s)	3BA1, 4BO2
Exam(s)	Third University Examination in Arts and BSC examination
Module Code(s)	CT319
Module(s)	Artificial Intelligence
Paper No.	1
External Examiner(s)	Prof. S. McClean
Internal Examiner(s)	Dr. M. Madden Dr. C. Mulvihill
Instructions:	Answer any 3 questions. All questions will be marked equally.
Duration	2 hrs
No. of Answer Books	1
No. of Pages	1
Department(s)	Information Technology

1.
(a) Explain what is meant by the term 'finite state machine'(5 marks)
(b) Show how a simple drinks dispenser may be modeled by a finite state machine. Assume that no change is given under any circumstances, that a drink costs exactly 60 cent, and that the only coins available are 10 cent, 20 cent and 50 cent (10 marks)
(c) 'Finite State machines are often used in game development' By considering the states 'awake', 'asleep', 'patrolling' 'fighting' and 'dead', indicate how a finite state machine could be used to model the behaviour of a guard character in a game (10 marks)

2.
(a) What do you understand by the term 'breadth first search'? (5 marks)
(b) Use the following connection information to sketch the first three moves of a breadth first search, starting at S:
S is connected to A, B, C
A is connected to S and D
B is connected to S, D, E, F
C is connected to S and F
D is connected to A, B, G, H
E is connected to B, H, I
F is connected to B, C, I, J
G is connected to D
H is connected to D and E
I is connected to E and F
J is connected to F
(15 marks)
(c) Briefly explain your understanding of the term 'heuristic search'(5 marks)

3.
(a) Briefly give your understanding of an 'artificial immune system' (8 marks)
(b) In the context of a neural network, explain the terms 'activation threshold', 'hidden layer' and 'weight' (9 marks)
(c) A genetic algorithm can be used for pathfinding. By considering a simple maze, or otherwise, briefly outline how the following two elements of such a genetic algorithm might be developed: a suitable encoding for chromosomes, a fitness function (8 marks)

4.
(a) What do you understand by the term 'interactive narrative'? (6 marks)
(b) Give an account of the interactive drama 'Façade', explaining the terms 'beat goal' and 'discourse act' in the course of your answer (12 marks)
(c) Does the work in (b) qualify as 'artificially intelligent' in your opinion? (7 marks)

5.'Artificial Intelligence continues to draw on natural systems for inspiration.' Discuss this statement. (25 marks)