LIMERICK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA LUIMNIGH

LIMERICK INSTITUTE OF TECHNOLOGY

SUMMER EXAMINATIONS 2017/2018

MODULE: COMP08007-DIGITAL GAME AI

PROGRAMME(S):
LC_KGDDM_KTH Bachelor of Science (Honours) Computing (Games Design and Development)

YEAR OF STUDY: 4

EXAMINER(S):
Eugene Kenny (Internal)
Mr. Derek O'Reilly (External)

TIME ALLOWED: **2 HOURS**

INSTRUCTIONS: **Answer 4 questions. All questions carry equal marks.**

PLEASE DO NOT TURN OVER THIS PAGE UNTIL YOU ARE INSTRUCTED TO DO SO.
The use of programmable or text storing calculators is expressly forbidden.
Please note that where a candidate answers more than the required number of questions, the examiner will mark all questions attempted and then select the highest scoring ones.

Requirements for this paper:
1. Calculators

QUESTION 1 **[25 Marks]**

(a) Outline with aid of a diagram the basic structure of a games artificial intelligence engine. **[5 marks]**

(b) In World Interfacing, a *Region Sense Manager* can be used to manage sense signals and sensors. Outline the functioning of the *Region Sense Manager.* **[10 marks]**

(c) A *Region Sense Manager* can lead to non-realistic effects in games. **[10 marks]**

Give examples of these non-realistic effects and outline an alternative method for managing sense signals and sensors.

QUESTION 2 **[25 Marks]**

(a) How can movement behaviours be used in *Obstacle Avoidance*? **[10 marks]**

(b) Complex movement behaviours can be constructed by combining more basic behaviours. Outline two approaches for doing this. **[15 marks]**

QUESTION 3 **[25 Marks]**

In *Pathfinding,* planning a path is often reduced to a graph search problem by:

1. Constructing a graph representing the planning problem
2. Searching the graph for a (hopefully, close-to-optimal) path

Give details of four approaches of how a graph can be constructed by *Skeletonisation* of the configuration space. What are the advantages and disadvantages of each approach?

QUESTION 4 **[25 Marks]**

(a) Describe how *Goal-Oriented Planning* is implemented to bring seemingly intelligent behaviours to computer games. **[15 marks]**

(b) Basic goal-oriented schemes can yield predictable results. How can uncertainty factors be implemented? **[10 marks]**

QUESTION 5 **[25 Marks]**

(a) What are the purposes and benefits of learning in computer games? What types of learning can be applied? **[10 marks]**

(b) *Action Prediction* attempts to predict the future actions of a player based on past actions. Outline two methods for achieving this. **[15 marks]**