

UNIVERSITY COLLEGE LONDON

University of London

EXAMINATION FOR INTERNAL STUDENTS

For The Following Qualification:–

M.Sc.

ESGV8: Space, Form, Behaviour and Its Production

COURSE CODE : ENVSGV08

DATE : 09–MAY–06

TIME : 14.30

TIME ALLOWED : 2 Hours

ESGV8 Space, Form, Behaviour and its Production

ANSWER BOTH PARTS A AND B

You must answer question 1 in PART A and 2 questions from PART B**PART A (Compulsory)****Answer all of question 1:**

1. Choose a specific implementation of generative, evaluative or simulation algorithm used in a design context. This may be based on any of the examples given in the course lectures or one of your own choosing.
 - a) Describe the function of the algorithm and its advantages over other techniques used for similar design problems. (15 marks)
 - b) Explain how the application of this algorithm enhances the user's creative process, and explain to what degree the algorithm itself can be considered to exhibit creativity. (15 marks)

Total 30 marks for Part A**PART B****Answer TWO and only two of the following four questions (all sections of each):**

2.
 - a) Explain the differences and the similarities between *genetic algorithms* and *genetic programming*. (25 marks)
 - b) How might *genetic programming* be used in design? (10 marks)
3.
 - a) Class four cellular automata are capable of generating complex and unpredictable behaviour from very simple, deterministic rules. How can the same principle be used in generating form? (25 marks)
 - b) Describe some architectural systems that exhibit a similar kind of emergent complexity. (10 marks)

(PART B CONTINUED OVERLEAF)

(PART B CONTINUED)

- 4.**
- a) Feedforward multilayer perceptrons and a Kohonen networks are both examples of artificial neural networks. Explain the difference between the two. (15 marks)
- b) Show how each of the above may be used. Give examples. (20 marks)
- 5.**
- a) What are the conceptual differences between a standard CAD system, a parametric CAD system, and a programmable, generative CAD system? (15 marks)
- b) What are the practical advantages of each system? (10 marks)
- c) In *On Growth and Form*, D'Arcy Thompson suggests that the form of living things is not predetermined genetically, but is a result of precise mathematical principles and the physical environment. How is this concept similar to the working method implied in parametric design. (10 marks)

Total for Part B: 70 marks

END OF EXAM