

Ollscoil na hÉireann, Gaillimh

National University of Ireland, Galway

Semester Two Examinations 1999/2000

Higher Diploma In Systems Analysis Examination

(Business Systems Development)

Advanced Programming Methods (MS876)

Professor R. O'Callaghan

Professor S. Collins

Ms. M. Hogan

Dr. M. Madden

Time allowed: TWO hours

Candidates are required to answer *TWO* questions from *EACH* section

Separate answer books must be used for each section

All questions carry EQUAL marks

Section A

Q.1.(a). Describe, in detail, the difference between divided and focussed attention. You should consider how they both affect user interface design.

(15 marks)

(b). Describe, in detail, the three different types of human memory.

(10 marks)

Q.2. Task analysis can be used to analyse users' tasks for the purpose of design. Describe, in detail, the process of Hierarchical Task Analysis.

(25 marks)

- Q.3.** Verbal Protocol (sometimes called Co-operative Evaluation) is a technique used to evaluate software products. Describe this technique in detail.

(25 marks)

Section B

- Q.4.(a)** Specify in detail, using pseudocode or another appropriate technique, the QuickSort algorithm. Clearly define the purpose and type of all variables used.

(10 marks)

- (b)** Below is an unsorted list of names and ages. Select **two** sorting algorithms (you may include QuickSort, if you wish). Demonstrate how **both** sorting algorithms would operate to sort the data by surname. In each case, briefly describe what happens at each iteration of the algorithm, and show the organisation of the data after each iteration.

Index	1	2	3	4	5
First name	Michael	Fred	Patrick	Stephen	Martha
Surname	Burke	Johnson	Walsh	Ryan	Fahy
Age	50	37	15	41	29

(12 marks)

- (c)** For real-world applications, what are the most important considerations in selecting a sorting algorithm?

(3 marks)

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Q.5.(a) Discuss the importance of program specification and design.

(5 marks)

(b) Select three popular program specification techniques. Describe each of these separately in detail, including brief examples as appropriate.

(15 marks)

(c) Briefly compare and contrast the three program specification techniques that you described above.

(5 marks)

Q.6.(a) "Routines should be loosely *coupled* and *strongly cohesive*." Explain both of these terms.

(5 marks)

(b) Discuss the benefits of good use of routines. In the context of this discussion, present guidelines for the organisation of routines.

(15 marks)

(c) Explain the role of routines in incremental development.

(5 marks)