



Liverpool John Moores University  
School of Computing and Mathematical Sciences

Semester 2 Examinations, 1997/98

## **CMSCD305 Software Systems: Planning & Design**

Duration 3 hours

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### **Instructions to candidates**

Do not open this question paper until you have been told to do so by the invigilator.  
A figure in [] denotes the number of marks available for that question or part of question.

There are 6 questions, 3 in Section A and 3 in Section B.

Answer 4 questions.

If you present answers to more than 4 questions, the first 4 of these answers will be assessed.

Questions carry 25 marks each.

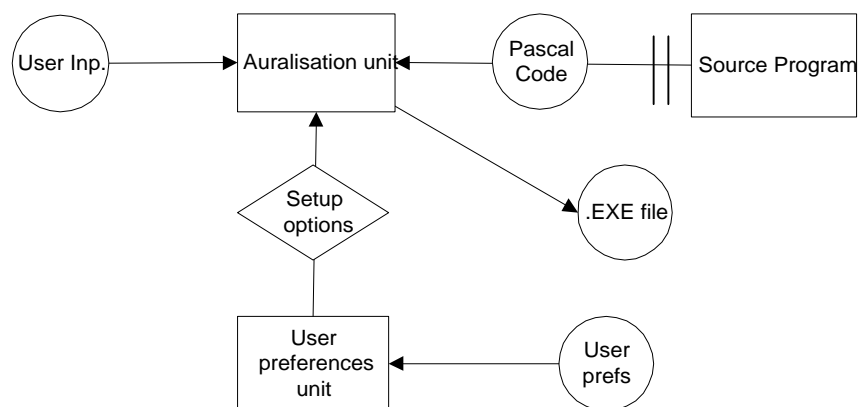
The total number of marks available is 100.

## Section A

- A1. (i) Describe the four primary aspects of Software Maintenance and give some indication of their relative frequencies. [8]
- (ii) Suggest and justify the criteria you would use to determine the candidate sub systems for preventive maintenance. [17]
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- A2. (i) Define what is meant by the term ‘software metric’. What do software metrics measure? [7]
- (ii) The Function Point has been described as a ‘dimensionless number on an arbitrary scale’. Discuss how this affects the usefulness of FPA (Function Point Analysis) as a software-sizing method. [10]
- (iii) “The KLOC ‘metric’ can be likened to the gift wrapping on a present – it reveals little, if anything, about the size or utility of the contents.” (PV, 1992) Is this statement correct? Give reasons for your answer. [8]
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- A3. “For years the software industry has been plagued by unprofessional and unethical practitioners, who, had they been in one of the established professions (e.g. Medicine, Law etc.) would certainly have been struck off, if not imprisoned, for their misdeeds.”
- Comment on this view of the software industry. [25]

## Section B

- B1. Figure 1 shows a possible view of the CAITLIN program auralisation system as a JSD network diagram.



**Figure 1: CAITLIN Network Diagram**

The auralisation unit is the collection of functions and procedures that deal with parsing, auralising (adding the musical code) and compiling the original source code. The user preferences unit is responsible for updating the system with user-chosen values of such system-wide aspects such as tempo, choice of synthesiser sound etc. The source program component models the life of a Pascal program within the CAITLIN system.

- (i) It is required to generate a report listing the number of times that an individual program has been loaded, auralised, compiled and run. The report should be generated when the user selects an appropriate menu option. Elaborate the network in Figure 1 to reflect this change. [7]
- (ii) A program may be viewed as having the following life history: first it is loaded and parsed. Then it may be auralised any number of times. After the first auralisation event it may be compiled any number of times. Following the first compilation the program may be executed any number of times.

Draw a JSD process structure diagram to show the life history of the process *Program*.

- (iii) It is claimed that JSD and Information Engineering both lead to the development of more-maintainable systems. Explain why such claims are made for the two methods. Describe and explain any similarities and/or differences between the two claims. [8]

[10]

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B2. (i) Avison & Fitzgerald criticised JSD as being self consciously incomplete as a method because it does not formally address requirements analysis. Discuss how you would address this problem on projects where you have to use the JSD method. [15]

- (ii) Discuss how two other system design methods, with which you are familiar, address the problem of requirements gathering. [10]

[10]

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B3. “All software development problems will be solved by the general acceptance of structured systems design methodologies.” Discuss. [25]

[25]

### EXAMINER'S STATEMENT

There are no corrections on this proof copy and the examination paper is now ready for printing. I am aware that the printed papers will be produced directly from this proof.

Please print  copies.

Special printing instructions for the examination paper

Signed ..... Date .....

### STATIONERY AND OTHER REQUIREMENTS

SCHOOL

MODULE

ITEM	NUMBER REQUIRED PER STUDENT	TOTAL NUMBER REQUIRED (ESTIMATE)
14 PAGE ANSWER BOOKS		
6 PAGE ANSWER BOOKS		
CONTINUATION BOOKS		
DRAWING PAPER A1		
DRAWING PAPER A2		
DRAWING PAPER A3		
GRAPH PAPER		
ABSTRACT PAPER		
DIMENSION PAPER		
TRACING PAPER A1		
TRACING PAPER A2		
TRACING PAPER A3		
DIAGRAMS		
DRAWINGS		
ANY OTHER REQUIREMENTS		

Are there any special items which may be taken into the examination by candidates? If so, please list here

Signed ..... Date .....