NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF APPLIED SCIENCE
COMPUTER SCIENCE DEPARTMENT
JULY SUPPLEMENTARY EXAMINATIONS 2005

SUBJECT: SOFTWARE METHODOLOGY
CODE: SCS5205

INSTRUCTION TO CANDIDATES

This examination paper consists of six [6] questions, all questions carry equal marks.
Answer any five [5] questions.

Time: 3 hours

QUESTION ONE

a) What are the benefits of an object-orientated approach to systems analysis and design? Discuss object-oriented analysis and design methodologies giving some examples. [10]

b) Discuss the advantages and disadvantages of prototyping as a systems analysis approach. [6]

c) Distinguish between a high level design and a low level design. [4]

QUESTION TWO

a) Explain the general programming concepts of: modular program design, program reusability and program portability. [6]

b) Software maintenance increases system entropy. Discuss this statement. In your discussion highlight the possible ways to counteract this effect. [8]

c) Give three strong reasons why we should be concerned with project management modelling tools? [6]

QUESTION THREE

a) Object Oriented Analysis (OOA) is said to refer to the methods of specifying requirements of the software in terms of the real world objects, their behaviour and interactions while Object Oriented Design (OOD) is concerned with the mapping of objects in the problem space into objects in the solution space and creating an overall structure of the system. Give a brief outline of the steps that may be involved in OOA and in OOD.

[10]

b) Explain the concept of Rapid Application Development (RAD) as a systems analysis and design methodology. [5]

c) State and describe any 5 user interface design principles. [5]

QUESTION FOUR

a) The PERT and Gantt charts are some of the modelling tools that are useful for managing a systems development project.
   i) Why does project management need models that are associated with a systems development project?
   ii) What information does a Gantt chart show that a PERT chart does not?
   iii) State one example of a popular project management software/ package that you know. [12]

b) The system manual should provide more detailed information than the online help and should be designed so that it can be used by different classes of system end user. To cater for these different classes of users and different levels of expertise, there are at least five documents, which should be delivered with a software system. State and describe any four documents that should be delivered together with a software system.

[8]

QUESTION FIVE

a) "Design is something you do when your brain is too small to hold the entire project". Comment. [6]

b) In relation to the Project Evaluation Review Technique (PERT), explain the following terms using simple examples to support your answer:
   i) The Critical Path and
   ii) Slack resources. [6]

c) Explain the Object Oriented Programming concepts of abstraction, encapsulation and inheritance. Describe the nature and characteristics of the Java programming language. [8]

QUESTION SIX

a) Outline the three modes of the COCOMO model for project cost estimation, explaining the modifications involved in each mode. [12]

b) Draw a state transition diagram for a simple CD player. [8]

END OF QUESTION PAPER