

**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**FACULTY OF APPLIED SCIENCES**  
**COMPUTER SCIENCE DEPARTMENT**  
**MAY EXAMINATIONS 2011**

**SUBJECT: SOFTWARE DESIGN METHODOLOGY**  
**CODE: SCS2201**

**INSTRUCTION TO CANDIDATES**

1. Answer any five questions
2. This paper consists of seven [7] questions

**3 hours**

**QUESTION ONE**

- a) Use appropriate examples to illustrate the perspectives portrayed by the three main tools of the Structured Systems Analysis and Design Methodology (SSADM), i.e. **ER models, Data Flow Diagrams and Entity Life Histories** [12]
- b) Explain any four guidelines that one should follow in designing the user interfaces or screens. [8]

**QUESTION TWO**

- a) Explain the characteristics used to evaluate the quality of software. [10]
- b) "Design is something you do when your brain is too small to hold the entire project". Comment on this statement. [4]
- c) What information is conveyed by these Object Oriented diagrams:
  - i) Deployment diagrams
  - ii) Use case diagrams [6]

**QUESTION THREE**

- a) Produce a use case diagram for an ATM System. Make appropriate assumptions for the completeness of data [12]

b) Construct a UML class diagram for the following scenario: [8]

Suppose a payroll system is to be built for a company X. The company has two types of employees, Contract and Salaried employees. There are several employees in the company. A manager is assigned to a set of employees, and an employee can only have one manager. All employees should have their names, employee numbers and dates of birth stored. Only contract employees should have their length of contract stored. For salaried employees we need to keep track of their date of retirement.

#### QUESTION FOUR

- a) As a software developer, two fundamental questions have to be answered before beginning any software project that is :
- i) Will you use a systematic process to do your work?
  - ii) If so, which process will you use?
- Give a detailed answer(s) to these two questions. [10]
- b) How do CASE Tools automate Software Development efforts? How do they differ from prototypes? [10]

#### QUESTION FIVE

- a) The Sequence diagram in figure 1 depicts a situation that happens when a particular member of a library tries to borrow a book, interpret the diagram and explain what is happening? [5]

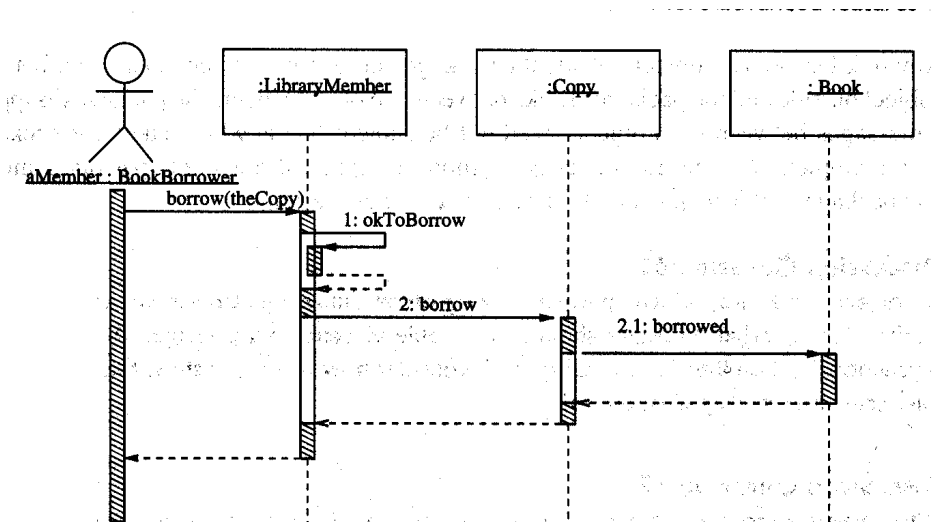


Figure 1

- b) Discuss the problems associated with the use of Natural language as a specification language. [15]

### **QUESTION SIX**

- a) The **Waterfall Model** is an example of a “document-driven” approach to software development. In document-driven approaches documents provide the measure of project progress. Do you think this measure is adequate? Suggest better ways to measure project progress. [8]
- b) Mrs. Xolo has invented a revolutionary new industrial process to convert straw to gold. A factory is being built to produce gold using this process. It will be completely automated. You have been asked to give advice on developing the software that will control the automatic factory. What Software Development Lifecycle will you use? Why would you choose this Lifecycle for this particular project? [8]
- c) In developing the software required by Mrs. Xolo (see (b) above) what would be your approach to Requirement Elicitation? [4]

### **QUESTION SEVEN**

Developing a final product out of a prototype is regarded as a build and fix. Discuss in detail the relationship that exists between the two methods. [20]

**END OF QUESTION PAPER**

