

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

SUBJECT: SOFTWARE DESIGN METHODOLOGY
CODE: SCS2201

INSTRUCTION TO CANDIDATES

1. This question paper consists of Section A and Section B.
2. Answer the question in Section A and any three from Section B.

Time: 3 hours

SECTION A

QUESTION ONE

- a) Compare and contrast object oriented and structure design paradigms. [5]
- b) Write the specification for an ATM system. The system must first read all records about the customer. Assume that the Database system is distributed around fifteen sites. [10]
- c) Using UML show the design of the ATM system specified in (a) above. [10]

SECTION B

QUESTION TWO

- a) Explain the main processes of software System Design. [10]
- b) Give the output for each process explained in (a). [7]
- c) What are the short comings of using natural language for describing requirements. [8]

QUESTION THREE

- a) Outline any four system Quality Attributes and say why each is important for any well designed system. [10]
- b) Using a practical example explain in detail the pipe and filter architectural style. [15]

QUESTION FOUR

- a) State and explain the phases in systems development life cycle (SDLC). [10]
- b) Compare and contrast Waterfall and Spiral process models of systems development. [15]

QUESTION FIVE

- a) Define the following terms as used in systems development:
 - (i) Software Architecture [2]
 - (ii) Stepwise refinement [2]
 - (iii) Functional requirements [2]
 - (iv) Information hiding [2]
 - (v) Inheritance [2]
 - (vi) Classes [2]
 - (vii) Abstraction [2]
- b) State the advantages and outline the conflicts of an explicit Architectural Design. [11]

QUESTION SIX

A computer is being used to monitor an industrial plant. The computer periodically inputs readings from instruments in the plant. Some of the reading requires conversion to normal units of measurements (e.g. microvolts into degrees Celsius). The computer checks each of the reading against permissible values. Alarm reports are displayed on a VDU screen when a value is outside its valid range.

- a) Using an object-oriented approach show the design of system described above. [15]
- b) What could be the likely concurrency control problems in this system? Show how your design will take care of them. [10]

END OF QUESTION PAPER

