IMIS HIGHER DIPLOMA QUALIFICATIONS

Contemporary Issues in Systems Design (H3)

Wednesday 4th December 2013 10:00hrs – 13:00hrs

DURATION: 3 HOURS

Candidates should answer ALL the questions in Part A and THREE of the five questions in Part B. Part A carries 40% of the marks available and Part B carries 60%. Candidates should allocate their time accordingly.

No reference material of any kind may be taken into the examination.

[Turn over]

PART A. Answer ALL questions in this section

Question A1

Identify **THREE** quality problems that may arise during systems development.

(5 marks)

Question A2

Identify **THREE** productivity problems that may arise during systems development.

(5 marks)

Question A3

Explain the difference between the terms “method” and “methodology” as used in information systems design.

(5 marks)

Question A4

How does the prototyping approach to systems development differ from an approach based on incremental development?

. **(5 marks)**

Question A5

What does the term “pattern” mean in the context of object oriented design?

(5 marks)

Question A6

How do “light” development methods (such as eXtreme Programming) differ from model-centric approaches such as the Unified Software Development Process (USDP).

(5 marks)

Question A7

What role do “abstract” classes play in the design of reusable software?

(5 marks)

Question A8

Explain what is meant by “syntactic correctness”, “consistency” and “completeness” in relation to Unified Modelling Language (UML) diagrams.

(5 marks)

PART B. Answer any THREE of the following FIVE questions.

Question B9

a) Describe, with suitable examples, what is meant by the following class stereotypes used in object oriented design:

i. Boundary Classes

(4 marks)

ii. Entity Classes

(4 marks)

iii. Control Classes

(4 marks)

b) Explain with the use of a suitable example how robustness analysis can be applied to produce an analysis class diagram for a Use Case.

(8 marks)

(Total 20 marks)

Question B10

Micro loans are small loans to borrowers who typically lack a good credit history. Typically, the loans will be used to finance start-up or development of the borrower's company, so that there is a realistic chance for repayment. The money in a loan can, unlike traditional loans, come from many lenders.

You have been asked to design a system to manage micro loans. The following information will need to be considered:

- Each borrower and lender must be registered with the system storing details of their name and address.
- The borrower must make a loan request which includes details of the latest date by which the loan must be granted, the total amount to be borrowed, the length of the payback period and a description of how the money will be used.
- Individual lenders can commit to lend a portion of the amount requested.
- A borrower can make more than one request, and take out more than one loan at a time.
- The loan will be issued through an "intermediary". This will typically be a local branch of a charity. We need to store the name and address of each intermediary.
- The borrower makes payments whenever they can. The amount and date of each payment must be registered in the system. The lenders share each repayment based on the size of the portion of the loan they provided.

- If the loan is not repaid before the deadline, a new date is agreed. The deadline might be changed many times. The system must store the history of deadlines that have been changed.

a) Identify and briefly describe four Use Cases for the Micro Loans system.

(8 marks)

b) Create a class diagram for the system from the above information. Include any attributes that you think may be needed.

(12 marks)

(Total 20 marks)

Question B11

a) Explain the difference between the "hard" and "soft" approaches to systems development.

(6 marks)

b) What general advantages are claimed for using a methodology to guide systems development.

(7 marks)

c) What might be the disadvantages of using an inappropriate methodology during systems development?

(7 marks)

(Total 20 marks)

Question B12

The following systems development activities are embodied in the Unified Software Development Process. Identify the Unified Modelling Language (UML) diagrams that are used during each of these activities and explain how they are used within that activity.

a) Requirements capture and modelling.

(5 marks)

b) System Architecture and Design.

(5 marks)

c) Interface Design

(5 mar

d) Data Management Design

(5 marks)

(Total 20 marks)

Question B13

a) Explain what is meant by “architecture” in the context of information systems design.

(5 marks)

b) Describe the following views of architecture used in the Unified Software Development Process (USDP). Identify the UML diagrams associated with each view.

i. Logical view

(3 marks)

ii. Development view

(3 marks)

iii. Process view

(3 marks)

iv. Physical view

(3 marks)

v. Scenarios

(3 marks)

(Total 20 marks)

END OF EXAMINATION