Exam June 2009, questions

Systems Development (Monash University)

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Monash University

Semester One Examinations Period

2009

Faculty of Information Technology

EXAM CODES: FIT2001 / FIT9030

TITLE OF PAPER: **Systems Analysis and Design**

EXAM DURATION: 3 hours writing time

READING TIME: 10 minutes

THIS PAPER IS FOR STUDENTS STUDYING AT: (tick where applicable)

☑ Berwick	☑ Clayton	☑ Malaysia	☑ Off Campus Learning	☐ Open Learning
☑ Caulfield	☑ Gippsland	☐ Peninsula	☐ Enhancement Studies	☑ Sth Africa
☐ Pharmacy	☐ Other (specify)			

Candidates must complete this section

STUDENT ID _ _ _ _ _ _ _ _ _ _ _ _ DESK NUMBER _ _ _ _ _

During an exam, you must not have in your possession, a book, notes, paper, calculator, pencil case, mobile phone or other material/item which has not been authorized for the exam or specifically permitted as noted below. Any material or item on your desk, chair or person will be deemed to be in your possession. You are reminded that possession of unauthorized materials in an exam is a discipline offence under Monash Statute 4.1.

AUTHORISED MATERIALS:

Calculator	**NO**
Open Book	**NO**
Specifically Permitted Items	**NO**

INSTRUCTIONS TO CANDIDATES:

1. Print your name and ID number in the section above.
2. **Answer all questions in the space provided in this examination paper.** Answers given anywhere else will not be marked.
3. You must use a pen (other than red) to write your answers.
4. This paper consists of 3 Parts. Individual marks for each question are indicated.
5. Total marks for this examination are 100.

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	Marks	
Part 1		**20**
Part 2		**40**
Q 3.1		**10**
Q 3.2		**10**
Q 3.3		**10**
Q 3.4		**10**
TOTAL		**100**

PART 1. MULTIPLE CHOICE QUESTIONS (20 * 1 marks) = 20 marks

Marking Scheme for Multiple Choice Questions:
1 mark for a correct answer
0 marks for a wrong or more than one answer
0 marks for no answer

Answer every question by circling the letter corresponding to the ONE best answer. Example:

QUESTION XX:

I learned in FIT2001 that:

(A) The assignment can be done one day before the submission date
B. If the day is too cold, I can excuse myself from going to lectures
C. FIT2001 is a common core unit at the Faculty of Education at Monash
D. FIT2001 is a common core unit at the Faculty of IT at Monash
E. None of the above

If you change your mind about an answer, place a line through the circle you have drawn around the incorrect answer and circle the correct answer. Example:

QUESTION XX:

I learned in FIT2001 that:

(A) The assignment can be done one day before the submission date
B. If the day is too cold, I can excuse myself from going to lectures
C. FIT2001 is a common core unit at the Faculty of Education at Monash
(D) FIT2001 is a common core unit at the Faculty of IT at Monash
E. None of the above

QUESTION 1.1:
A determination of economic feasibility of the project always requires a thorough ____.

A. proof of concept prototype

B. system scope document

C. cost/benefit analysis

D. work breakdown structure (WBS)

QUESTION 1.2:
A concept that allows subclasses to share the characteristics of their superclasses is called _____.

A. encapsulation

B. aggregation

C. multiplicity

D. inheritance

QUESTION 1.3:
An external agent or actor that receives data from the system is called _____.

A. an activity

B. a destination

C. a source

D. a trigger

QUESTION 1.4:
A _____ is a data flow diagram that summarizes all processing activity within the system in a single process symbol.

A. level of abstraction

B. context diagram

C. data flow

D. data store

QUESTION 1.5:
During the planning phase of the system development life cycle (SDLC), the ____ helps to define the scope of the problem.

A. proof of concept prototype

B. project evaluation and review technique (PERT) chart

C. critical path method (CPM) chart

D. context diagram

QUESTION 1.6:
A metaphor of human-computer interaction (HCI) in which the user interacts directly with objects on the display screen, is referred to as ____.

A. document metaphor

B. direct manipulation metaphor

C. desktop system units

D. dialog metaphor

QUESTION 1.7:
Questionnaires can be useful in information gathering when users ____.

A. do not have time for interviews

B. need prompting to respond to questions

C. are not well-informed

D. are widely distributed geographically

QUESTION 1.8:
High coupling ____ in a system.

A. is easier to maintain

B. adds complexity

C. decreases visibility between classes

D. reduces ripple effects in a system when changes occur

QUESTION 1.9:
The objective of a structured walkthrough is to ____.

A. fix problems in the system

B. find errors and problems

C. walkthrough a piece of work

D. inform the project leader of progress

QUESTION 1.10:
User interface objects in a sequence diagram often are labeled with the stereotype ____.

A. control

B. entity

C. view or boundary

D. persistent

QUESTION 1.11:
A class that represents a many-to-many association between two other classes is called an ____ class.

A. association

B. associative entity

C. encapsulated

D. inherited

QUESTION 1.12:
____ refers to the degree to which all of the code within a module contributes to implementing one well-defined task.

A. Cohesion

B. Coupling

C. Pseudocode

D. Transform analysis

QUESTION 1.13:
An event that occurs as a result of reaching a point in time is called ____ event.

A. a state

B. a temporal

C. a logical

D. an external

QUESTION 1.14:
High-level design that defines the overall structure of a system is called ____ design.

A. system

B. functional

C. nodal

D. architectural

QUESTION 1.15:
The traditional approach to information systems development describes activities as ____.

A. objects that interact with people and each other

B. objects that send and respond to messages

C. processes carried out by people or computers

D. a collection of interacting objects

QUESTION 1.16:
Which of the following is that part of the three-layer architecture that contains the programs that implement the business rules of the application?

A. user layer

B. data layer

C. domain or business logic layer

D. view layer

QUESTION 1.17:
The "includes" relationship represents the idea of ____.

A. one use case being used by another

B. classes included within use cases

C. embedding classes within other classes

D. embedding states within other states

QUESTION 1.18:
Scope creep refers to ____.

A. requests to add new functions after decisions have been finalized

B. determining the priority of each function

C. deferring some functions until later

D. rating the importance of each function

QUESTION 1.19:

Use cases can be organized by ____.

A. subsystem

B. the needs of the project team

C. grouping all cases that involve a specific actor

D. all of the above

QUESTION 1.20:
A good ____ includes a detailed explanation of the information needs of an organization and the processing requirements that must be fulfilled.

A. packaged software

B. prototype

C. turnkey system

D. request for proposal (RFP)

END OF PART 1

PART 2. SHORT ANSWER QUESTIONS (5 + 5 + 5 + 5 + 5 + 5 + 5 + 5) = 40 marks

Question 2.1 The Systems Analyst (5 marks)

Explain why a systems analyst needs to understand how people think, how they learn, how they react to change, how they communicate and how they work.

Question 2.2 Requirements gathering **(5 marks)**

In systems analysis and design, what is the difference between functional requirements and non-functional requirements? In your answer include an example of each.

Question 2.3 Structured analysis **(5 marks)**

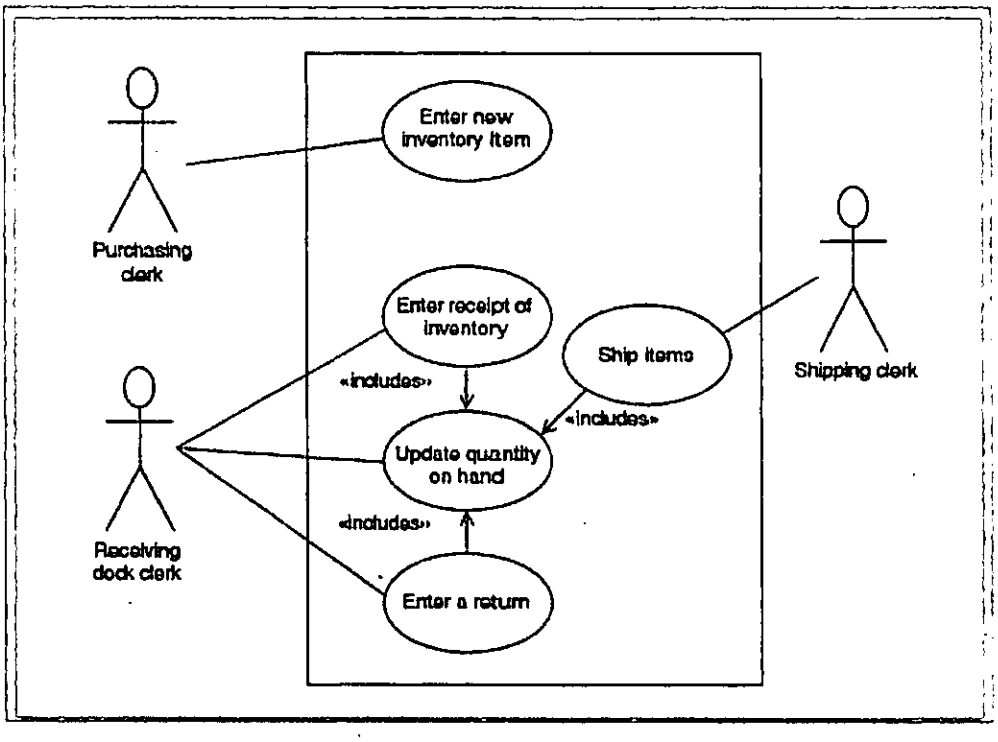
Show and briefly describe the five component parts (symbols) that can be used in drawing data flow diagrams.

Question 2.4 Structured design **(5 marks)**

Briefly explain the structured design technique called *transform analysis*. What is meant by the term *central transform*?

Question 2.5 Object oriented analysis **(5 marks)**

Interpret and explain the use case diagram in the following figure (taken from the unit text). Explain the various roles of those using the system and what functions each role requires. Explain the relationships and how the use cases are related to each other.



A use case diagram for an inventory system.

Question 2.6 Object oriented design **(5 marks)**

What is three-layer design? What are the most common layers found in three-layer design and what is the recommended way to carry out three-layer design (in what order are the layers designed)?

Question 2.7 Interface design **(5 marks)**

Name and describe the two key principles proposed by Donald Norman to ensure good interaction between a person and a computer.

Question 2.8 **System interfaces, controls and security** **(5 marks)**

Describe the kinds of integrity controls you would recommend to place on all output reports. Why?

END OF PART 2

PART 3. SYSTEMS ANALYSIS AND DESIGN QUESTIONS (10 + 10 + 10 + 10) = 40 marks

Read the following case study that describes an on-line book exchange called *TheEyesHaveIt.com*. Questions 3.1, 3.2, 3.3 and 3.4 are based on this case study.

TheEyesHaveIt.com Book Exchange is a type of e-business exchange that does business entirely on the Internet. The company acts as a clearing exchange for both buyers and sellers of used books.

For a person to offer books for sale, he/she must register with EyesHaveIt. The person must provide a current physical address and telephone number as well as a current e-mail address. The system will then maintain an open account for this person. Access to the system as a seller is through a secure, authenticated portal.

A seller can list books on the system through a special Internet form. Information required includes all of the pertinent information about the book, its category, its general condition, and the asking price. A seller may list as many books as desired. The system maintains an index of all books in the system so that buyers can use the search engine to search for books. The search engine allows searches by title, author, category, and keyword.

People wanting to buy books come to the site and search for the books they want. When they decide to buy, they must open an account with a credit card to pay for the books. The system maintains all of this information on secure servers.

When a request to purchase is made, along with the payment, TheEyesHaveIt.com sends an e-mail notice to the seller of the book that was chosen. It also marks the book as sold. The system maintains this as an open order until it receives notice that the books have been shipped. After the seller receives notice that a listed book has been sold, he/she must notify the buyer via e-mail within 48 hours that the purchase is noted. Shipment of the order must be made within 24 hours after the seller sends the notification e-mail. The seller sends a notification to both the buyer and TheEyesHaveIt.com when the shipment is made.

After receiving notice of shipment, TheEyesHaveIt.com maintains the order in a shipped status. At the end of each month, a check is mailed to each seller for the book orders that have been in a shipped status for 30 days. The 30-day waiting period is to allow the buyer to notify TheEyesHaveIt.com if the shipment does not arrive for some reason, or if the book is not in the same condition as advertised.

The buyers can, if they want, enter a service code for the seller. The service code is an indication of how well the seller is servicing book purchases. Some sellers are very active and use TheEyesHaveIt.com as a major outlet for selling books. So, a service code is an important indicator to potential buyers.

Question 3.1 Class diagram **(10 marks)**

Develop a domain class diagram for the *TheEyesHaveIt.com* book exchange case study.

Use this space to continue your answer to question 3.1 (if required).

Question 3.2 Use case modeling **(10 marks)**

Draw a use case diagram for the *TheEyesHaveIt.com* book exchange case study. Make sure you include a use case called "Purchase a book".

Use this space to continue your answer to question 3.2 (if required).

Question 3.3 Use case narrative **(10 marks)**

Develop a detailed use case narrative for the use case "Purchase a book" for the *TheEyesHaveIt.com* book exchange case study.

Use this space to continue your answer to question 3.3 (if required).

Question 3.4 Sequence diagrams **(10 marks)**

Draw a first-cut sequence diagram (not a system sequence diagram) for the use case "Purchase a book" for the *TheEyesHaveIt.com* book exchange case study.

Use this space to continue your answer to question 3.4 (if required).

END OF PART 3

THE NEXT THREE PAGES ARE SPARE SPACES

CLEARLY NUMBER YOUR ANSWERS AND INDICATE IN THE RESPECTIVE QUESTIONS ON THE PREVIOUS PAGES IF THERE ARE ADDITIONAL ANSWERS ON THESE PAGES

SPARE SPACES FOR ANSWERS

SPARE SPACES FOR ANSWERS

SPARE SPACES FOR ANSWERS

END OF FINAL EXAM PAPER