FINAL EXAMINATION
AUTUMN SESSION 2008
SCHOOL OF COMPUTING AND MATHEMATICS

Student Family Name:

Student Given Names:

Student Number:

Course:

Unit Name: Systems Analysis and Design
Unit Number: 300585
Time Allowed: 3 hours plus 10 minutes reading time
Number of Questions: Total of 36 questions
Total Number of Pages: 10 pages
Lecturer's Name: Dr. Joanne Curry

INSTRUCTIONS
PLEASE READ CAREFULLY BEFORE PROCEEDING

1 Write your name and student number on the top of this examination paper, scan sheets and on ALL answer booklets
2 This is a CLOSED book examination.
3 Write Multiple Choice (Part A) answers on scan sheets provided.
4 Write answers to Part B, Part C and Part D in the answer booklets only.
   IMPORTANT: ANSWER EACH PART IN A SEPARATE BOOKLET
   This means you should hand in 3 answer booklets in total (plus the scan sheet/s).
5 Part A – 25 multiple choice questions, total of 25 marks;
   Part B – 6 short answer questions, total of 30 marks;
   Part C – 4 modeling questions, total of 30 marks.
   Part D – 1 extended answer question, total of 15 marks
   (Total of 100 marks).

DO NOT TAKE THIS PAPER FROM THE EXAMINATION ROOM
PART A – MULTIPLE CHOICE (25 Questions, 1 Mark Each)
(Please write answers on SCAN SHEETS)

1. The five phases of the Systems Development Life Cycle are:
   a. Analysis, Planning, Gathering, Diagramming, Construction
   b. Planning, Construction, Implementation, Modeling, Support
   d. Planning, Analysis, Design, Implementation, Support

2. A benefit derived from the creation of an information system that cannot be measured easily in dollars is:
   a. Intangible benefit
   b. Estimated benefit
   c. Tangible benefit
   d. None of the above

3. The functionality of the system or what the information system will do is called the ______ of the system.
   a. Business need
   b. Intangibles
   c. Requirements
   d. Tangibles

4. A line that marks the inside and outside of a system is the:
   a. external state boundary
   b. automatic boundary
   c. automation boundary
   d. None of the above

5. Logical Models:
   a. clearly commit to a particular technology
   b. must be developed in the design phase
   c. Do not commit to any particular technology
   d. Must be developed in the implementation phase

6. Schedule feasibility analysis refers to the risks associated with the ----
   a. risk that the project will not be completed on time.
   b. risk that the schedule was calculated erroneously.
   c. risk that there will not be enough manpower to complete the scheduled tasks.
   d. risk that the schedule will be changed by upper management.
7. The primary objective of the implementation phase covers the following activities EXCEPT:
   a. construct software components
   b. convert data
   c. install the system
   d. Enhance the system

8. Each use case describes how the system reacts to a(n) _____ that occurs to trigger the system.
   a. external entity
   b. data flow
   c. process
   d. event

9. Samantha the senior systems analyst, is concerned that she and the end-users at her company do not have experience with a new scanner technology that will soon be implemented. This identified risk falls under _____ feasibility.
   a. economic
   b. functional
   c. organizational
   d. technical

10. _____ tests individual code modules or methods before they are combined with other modules or methods.
    a. Driver testing
    b. Integration testing
    c. System testing
    d. Unit testing

11. A diagram showing system behavior along with key actors that interact with the system is:
    a. An entity-relationship diagram
    b. A use case diagram
    c. A class diagram
    d. An entity-use diagram
12. The purpose of the context diagram is to:

   a. define the branching that will occur within the system.
   b. define the detailed processing that will be performed by the system users.
   c. show the overall system in its environment with key data flows going to and from
      the external entities.
   d. show the major subsystems in the system and define their interactions with each
      other and with the external entities.

13. The logic of each program module is defined in which phase of the systems development
    life cycle (SDLC)?

   a. Implementation
   b. Analysis
   c. Planning
   d. Design

14. Which of the following is not in the support phase?

   a. Verify and test
   b. Enhance the system
   c. Maintain the system
   d. Support the users

15. The information gathering technique that is most effective in combining information from
    a variety of perspectives, building consensus, and resolving discrepancies is the

   a. interview.
   b. JAD session.
   c. questionnaire.
   d. document analysis.

16. Three major types of approach to system implementation are:

   a. Phased, direct, parallel
   b. Partial, direct, parallel
   c. Phased, single, parallel
   d. None of the above

17. Which of the following is NOT a step in building an ERD?

   a. identify entity attributes.
   b. define relationships between entities.
   c. populate the diagram with sample data.
   d. identify entities.
18. An associative entity
   a. is illegal in entity-relationship diagramming.
   b. can exist without another related entity.
   c. makes an entity-relationship diagram more complex.
   d. is created to store information about two entities that share an M:M relationship

19. The unique feature of an object-oriented approach is that objects ------
   a. include both logic and data.
   b. include complex data structures.
   c. execute functions.
   d. are temporary program elements.

20. Which of the following development strategies is preferred when the business need is common and time is a constraining factor?
   a. in-house, custom development
   b. purchased software
   c. end-user development
   d. outsourcing

Refer to the diagram below to answer question 21

21. The diagram shows that it is not possible for:
   a. Customers to create new orders
   b. Order clerks to create new orders
   c. Order clerks to update orders
   d. Customers to look up item availability
22. Encryption is:
   a. The process of converting data into a readable form
   b. A computer readable plastic card
   c. The process of altering data so that it is unreadable by unauthorized users
   d. Transmitting data outside the organization

23. As compared to conventional system development, prototyping usually results in _______ system development.
   a. Slower
   b. Eliminating
   c. Faster
   d. none of the above

Refer to the diagram below to answer question 24.

![Diagram](image)

24. Which of the following statements are TRUE?
   a. An employee can drive many trucks
   b. A Store receives deliveries from one truck
   c. An employee must work at only one store
   d. A truck can deliver to only one store

25. The designer needs to design the details of the language for the user to send messages to the computer and for the computer to send messages to the user. This interaction describes the:
   a. desktop metaphor.
   b. direct manipulation metaphor.
   c. document metaphor.
   d. dialog metaphor.
PART B – SHORT ANSWERS (6 Questions- Total 30 marks)

(Briefly discuss the short answer questions. Write a maximum of 5-10 sentences.)
CLEARLY LABEL EACH QUESTION IN THE ANSWER BOOKLET

Question 26. (5 marks)
Define and describe the steps involved in the Analyst's approach to problem solving.

Question 27. (5 marks)
Requirements gathering is a major activity in a systems project.
   a) Who are the primary sources of information for systems requirements? (1 mark)
   b) What is the difference between functional requirements and nonfunctional requirements? (2 marks)
   c) Give one example each for functional and nonfunctional requirements for a web-based Library system. (2 marks)

Question 28. (4 marks)
   a) What is a database schema? (1 mark)
   b) Describe the steps used to transform an ERD into a relational database schema. (3 marks)

Question 29. (6 marks)
   a) Explain the difference between tangible and intangible benefits. (2 marks)
   b) What is an event? (1 mark)
   c) What are the 3 different types of events? Give examples of each event type in a library information system. (3 marks)

Question 30. (4 marks)
   a) What term is generally used to describe the study of the end users and their interaction with computers? (1 mark)
   b) What are the three aspects of the system that make up the user interface for a user? (2 marks)
   c) Give an example of one aspect. (1 mark)

Question 31. (6 marks)
   a) Input integrity controls are used to reduce input errors. Briefly describe four types of input controls and how each works. (4 marks)
   b) A payroll system has a data entry sub-system that is used to enter time card information to calculate employee hours. What kind of controls would you implement to ensure that the data entered is correct and error-free? (2 marks)
PART C – MODELLING QUESTIONS (4 Questions – Total 30 marks)

Question 32: (5 marks)

Develop a context level diagram for the scenario described in the following narrative. Clearly indicate the external entities, and data flows.

Delaney Party Organisation Pty Ltd (DPO) is a new service-oriented business which will operate in all States of Australia. The business supplies services for the organization of out-of-the ordinary parties. Although younger age groups (21 and under) are a specialty, any age group can be catered for. The business is rapidly expanding and wishes to implement a new Client Services System (CSS). This system will interact with potential and actual clients and external service providers, helping to manage most aspects of its day-to-day operations.

Clients can look through the web site at the various party services offered and can request information on particular services by submitting a “request” to the CSS. If someone then decides to purchase a service they must become a member of the Delaney Party Club. This requires the client to submit a New Member application and the system responds by issuing the client a unique membership number. DPO does not provide all Party Services themselves, some services are outsourced to external companies.

Payments for party services can be made online with real-time credit card verification with the client’s Bank.

Management at DPO receives various Member and Services Reports from the system on a weekly basis. The Marketing department is very active in their promotion of the ‘Club’. Promotional material is frequently generated by the system and dispatched to Club members. The details for these new promotions are generated by the Marketing department. Once the promotion has been run, summary details regarding the promotion results are returned to the Marketing department.

Question 33: (10 marks)

Develop an ERD (Entity Relationship Diagram) for the system described in the following narrative. Clearly indicate the entities, relationships (mandatory, optional) and cardinalities. Include associative entities if required.

The Y2K Gym runs several types of fitness classes. The Gym has 10 instructors and each instructor can run multiple classes per month. Each class can handle up to 20 trainees. If an individual class has fewer than 10 trainees in it, it will be canceled. Each class is taught by one instructor. Each instructor may teach up to 10 individual classes per week. Each trainee may take up to five classes per week.
Question 34: (10 marks)

Develop a System Level DFD (Data Flow Diagram) for the system described in the following narrative. Clearly name and indicate the processes, data stores and data flows.

The UWS library has recently installed a computerized Library information system. Students select items for borrowing, take them to the checkout counter. The student card is validated against the student database. Only valid card holders are allowed to borrow books. If the card is invalid the system issues a message. The details of the books are entered into the system and the borrowings are recorded in a "loan database". The system issues a ticket to the student, containing the details of the books and the due dates.

Question 35: (5 marks)

Use case diagrams are developed as an initial step in defining Object Oriented requirements. Draw a use case diagram, using the information in the scenario below.

The Pinnacle Health Centre has two types of doctors: General Practitioners and Specialists.
- A General Practitioner (GP) is a general kind of doctor who can treat common ailments.
- A Specialist is a doctor who specialises in a particular field of medicine and treats patients with only those particular problems.

The Health Centre also has a number of Nurses. A Nurse can treat patients with common ailments if the GPs are overloaded.

Some patients need Prescriptions or additional Tests. Prescriptions can be written by either a GP or a Specialist. However, ordering of tests can only be done by the Specialists.

Patients will not interact with system at any time.

**PART D ON NEXT PAGE**
PART D – EXTENDED ANSWER QUESTION (1 Question – Total 15 marks)

Question 36: (15 marks)

Write an extended answer detailing the purpose of an SDLC and its importance to successful information systems development. Discuss the phases of a typical SDLC, the major deliverables (outputs) of each phase and how the activities conducted in each phase are related and build upon each other throughout the lifecycle of a development project.

****** End of Exam Questions ******