UNIVERSITI SAINS MALAYSIA

First Semester Examination
Academic Session 2000/2001

September/October 2000

CSI503 – Information System Analysis & Design

Duration : [3 hours]

INSTRUCTION TO CANDIDATE:

*   Please ensure that this examination paper contains **FOUR** questions in **SEVEN** printed pages before you start the examination.

*   Answer **ALL** questions. Start every question on a new page.

*   You can choose to answer either in Bahasa Malaysia or English.

ENGLISH VERSION OF THE QUESTION PAPER

1. (a) Define and differentiate the following terms:

    (i)   data-oriented approach and process-oriented approach

    (ii) processing logic and data flow

                                                                    (20/100)

    (b) Identify **three** players in system development and explain the responsibilities that each player should carry in developing an information system project.

                                                                    (20/100)

    (c) The activities involved in managing a project occur in four phases.

    (i)   List these four phases.

    (ii) Which of the four phases of the project management process do you feel is the most challenging? Why?

                                                                    (20/100)

    (d) The following table illustrates the benefits and costs incurred for a project in Rendezvous Company.

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Totals
Net Economic Benefit	$0	$50,000	$55,000	$60,000	$65,000	$70,000	
Discount Rate (10%)							
PV of Benefits							
NPV of all Benefits							
One-Time Costs	($90,000)						
Recurring Costs	$0	$40,000	$40,000	$40,000	$40,000	$40,000	
Discount Rate (10%)							
PV of Recurring Costs							
NPV of all Costs							
Overall NPV							

    (i)   Calculate the Net Present Value (NPV) for the benefits and costs of the project above using the Discount Rate as shown (10%).

    (ii) Calculate the overall Return on Investment (ROI) of the project.

    (iii) Present the break-even analysis (BEA) for the project.

    (iv) What can you conclude about the economic feasibility of this project?

                                                                    (40/100)

2. (a) Baseline Project Plan (BPP) report provides the structure for conducting the analysis phase. Explain briefly the contents of this report which helps the analyst team to decide whether to pursue the analysis activity for a project or not.

(20/100)

(b) Describe the analysis phase of the systems development life cycle (SDLC) in terms of its four major sub phases.

(20/100)

(c) The following decision table illustrates the determination of payment authorization for Abad Harapan Company.

	1	2	3	4	5	6	7	8	9	10	11	12
Amount of invoice (RM)	< 100	< 100	< 100	< 100	100 – 1000	100 – 1000	100 – 1000	100 – 1000	>1000	>1000	>1000	>1000
Invoice duration (days)	< = 10	< = 10	> 10	> 10	< = 10	< = 10	> 10	> 10	< = 10	< = 10	> 10	> 10
Payment discount	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
Action	A	A	A	A	A	S	A	A	P	P	P	P

Key:
Action   A = authorize payment
         S = set invoice aside
         P = put invoice on cash requirement report

Your task now is to **fully simplify** this decision table by combining necessary rules and by checking the completeness and accuracy of the rules in this table.

(20/100)

(d) The Topaz Heights apartment complex uses the following system for processing security deposits and rental payments:

When a tenant signs a lease and pays a security deposit, the manager creates a data sheet on the tenant which includes name, apartment number, phone number, permanent address (if other than the new apartment), amount of rent, amount of security deposit, move-in date, length of lease, pet deposit (if any), and person to notify in case of an emergency. The manager sends this form to the data processing (DP) department to be entered on-line into the accounts receivable (A/R) file. The manager also gives a receipt and a copy of the lease to the tenant.

A card is created with the tenant's name, apartment number, amount due, and amount paid from the A/R file and send back to the manager. The manager then attaches the security deposit cheque to the card.

This card and cheque are sent to A/R department where daily deposits are batched and the cheques are deposited into the proper bank account. The cards that came in with the cheques are sorted by name alphabetically and will be entered into a computer. The cards are read, a daily cash report is generated, and the A/R file is updated. At the end of the month, new cards are generated for each tenant. As the tenants pay the rent due, a card is pulled for each tenant and attached to the cheque or money order payment. The same procedure (from ** to **) is followed for the rent payment as well as the security deposit.

On the tenth day of the month, a delinquent list will be generated by the A/R department from the A/R file. The list includes all tenants who have some balance due on their account. The manager sends a notice to each delinquent tenant along with an overdue charge.

(i)   List the main processes, entities and data stores for this system.

(ii)   Draw a level-0 logical data flow diagram for the system above.

Note: If you discover that the narrative is incomplete, make up reasonable assumptions to complete this case.

(40/100)

3. (a) Compare and contrast the concepts of object, class and instance. Give an example of each one using any library computer system as the basis.

(20/100)

    (b) What trends in IS encouraged the invention of the RAD approach to system development and relate that to any system around you.

(20/100)

    (c) Rock & Roll (R&R) is a music CD and tape wholesale company. It's inventory control system keeps track of all the CDs and tapes in stock. Among the relevant data items are:

Product Code,
Classification (e.g. R&B, Jazz, Rock, Classical etc),
Title,
Artist,
Released Date,
Manufacturer information (Manufacturer Name, address, telephone no, contact person),
Quantity on hand,
Lead time (in days),
Unit price, and
Order status (shipped, out of stock, processing, etc)

(i) Design a form-fill interface for the inventory control system that could be used on a PC display screen to capture all the relevant data.

(ii) What would you do differently if you were to design a web-based version of the same task as in problem 3(i) above. Indicate the types of GUI controls you might use and where.

(iii) Of the two design you did, which would you say is better suited to the task? Why? List three reasons for your choice.

(30/100)

(d) Below is the Level-0 DFD for Rock & Roll's Inventory Control System:
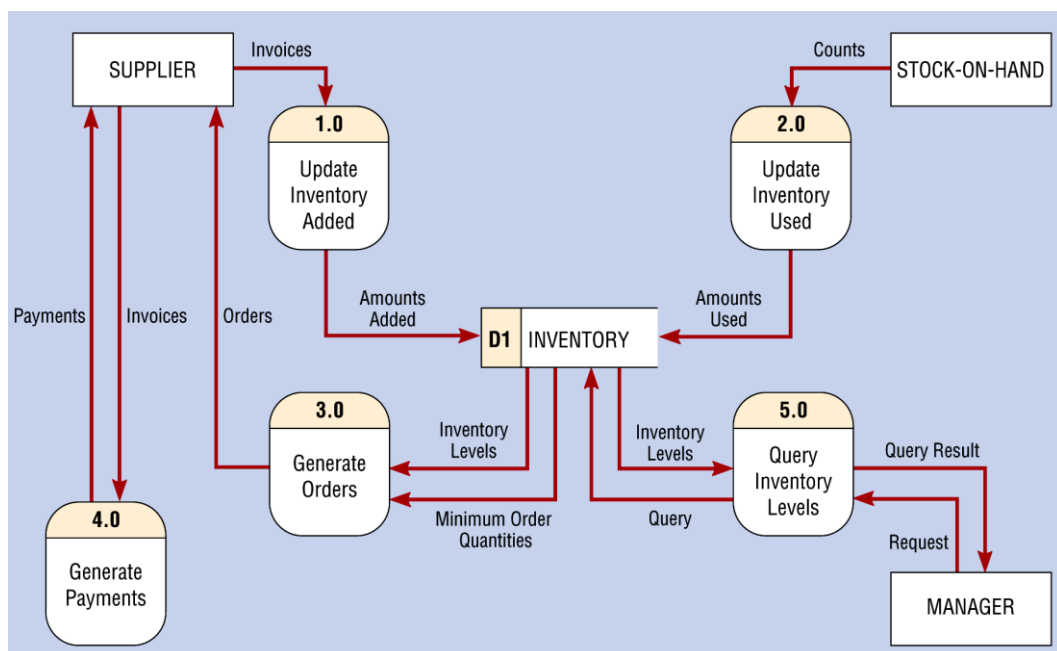
(i) Identify and state the central transform(s) and/or transaction center(s), if any.

(ii) Convert your DFD into a refined structure chart.
(*Hint: You may need to refine the DFD first to account for the data flows that bring data into and out of a process*)

(30/100)

4. (a) Relation INVENTORY below stores information about Rock & Roll's stock. Each inventory item is uniquely identified by its Product-Code and is manufactured by one company. The manufacturer's address, telephone number and contact person are functionally dependent on the manufacturer's company name.

> INVENTORY (Product-Code, Classification, Title, Artist, Release-Date, Manufacturer-Co-Name, Address, Telephone-No, Contact-Person-Name, Qty-on-hand, Unit-Price, Order-Status)

   (i)   What is the normal form of the relation?

   (ii) Should the relation be normalized further? If yes, normalize it to a higher form. If no, explain why.

(20/100)

(b) You have been hired as a consultant to Rock & Roll Warehouse. The owner proudly proclaims, "We are ahead of our time. We are already doing two-tiered client/server. We use Microsoft Access™ as our database server."

Explain to the owner why simply placing the Access™ data on a file server does not implement two-tiered client/server.

(20/100)

(c) Your systems development team is close to completing the system for Rock & Roll. Elvis is quite confident that the programs that he has written for Rock & Roll inventory system will perform as necessary, since they are similar to programs he has done before. Your team has been very busy and would ideally like to begin full systems testing as soon as possible.

This is what some of your team members have proposed for the test schedule:

   (i)   Skip desk checking of the programs (since similar programs were checked in other installations; Elvis has agreed).

   (ii) Do full systems testing with large amounts of live data to show the system is working.

Respond to each step in their proposed test schedule.

(20/100)

(d) Describe the process for controlling maintenance request. Should all requests be handled in the same way? Are there situations when you should be able to circumvent the process? If so, when and why?

(20/100)

(e) After going through the course, how do you think can a successful and thorough systems analysis be ruined by a poor systems design? Answer the question relative to these two factors:

(i) The impact on the subsequent implementation of the system.

(ii) The lifetime of the system after it is placed into operation.

(20/100)

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