The Open University of Sri Lanka
B.Sc. Degree Program – Level 05

Final Examination - 2006

CSU3277: Software Engineering: Paper I

Duration: 2½ Hours

041

Date: 06.11.2006 Time: 9.30 am – 12.00 noon

Answer **FOUR** questions **ONLY**

(01)

(a) Describe six *properties* of a *software system.*

(b) Discuss why is it important to do a careful *requirement analysis* before a software project is initiated.

(c) What are the *techniques* that can be used for the purpose of *gathering requirements*?

(d) What are the *problems* that you might come across when identifying *requirements*?

(02)

(a) Discuss *top down* and *bottom up* design techniques. Compare these two design techniques giving the advantages and disadvantages of them.

(b) Discuss the advantages of designing *modules* in a *software system*. Why should they be independent of one another as much as possible?

(c) When designing *modules*, two important factors should also be considered. What are they?

(03)

(a) What unique rules apply when drawing *context diagrams*?

(b) A computer is to be used to monitor an industrial plant. The computer periodically gets readings from instruments in the plant. Some of the readings require conversion to a normal unit of measurements. The computer checks each of the readings against permissible values. The alarm reports are displayed on a VDU screen when a value is outside its valid range.

Draw a *level 0* data flow diagram for this problem and then identify suitable programming modules.

(04)

Prepare a suitable *decision table* to specify the circumstances described below:

"When an order is received from sales department, each item in the order is checked to see if it can be met from current inventory. If sufficient inventory is held, the warehouse clerk adjusts the stock records and passes the item for picking and dispatching. Each time the stock records are changed, the new inventory level is compared to the safe_reorder level, which is marked on the stock_item card. If the new inventory level is below the safe_reorder level, the warehouse clerk writes out a purchase order form, notes the quantity ordered on the stock_item card and passes the purchase order form to the Chief Buyer for approval and dispatches to the supplier".

"If there is some inventory, but not enough to fill the order, (part_fulfillment), the warehouse clerk dispatches the items available, adjusts the stock records and creates a back_order for the required amount. The back_order is filed in part-number order awaiting receipt of shipment. If the item has been previously ordered, the warehouse clerk sends an expedite_delivery notice to the Chief Buyer. If the item is not on order, a purchase order form is prepared".

"If the item is completely out_of_stock, a back_order is created and filed as above and the clerk sends an expedite_delivery notice to the Chief Buyer whether or not the item is already on order".

(05)

Draw up a *decision tree* to show the logic of the process described in the above narrative given in question (04).

(06)

(a) In a university, a student may take several subjects for a particular degree program. We need to keep each student's registration number, name and address. A student is registered with a faculty of the university. Each faculty is given a number and a name. A faculty has several departments. A department may consist of several lecturers who work for that department. Each of them may teach several subjects. A department may offer several subjects.

Draw an *Entity Relationship Diagram (ERD)* for this problem.

(b) The STUDENT table in the above ERD contains records of the students on a three year degree program and is sorted into the ascending order of the year. A program is required to count the number of second year students. Obtain the structure chart for the above table.

Draw the structure chart to obtain the number of 1st year students who have paid their fees using the STUDENT table.