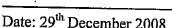The Open University of Sri Lanka
B.Sc. Degree Program – Level 05
Final Examination 2008/2009
CSU3277: Software Engineering: Paper I
Duration: 2½ Hours

:079

Date: 29th December 2008   Time: 9.30am – 12.00 noon

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

1.
   i.   Identify five distinct stages in the life cycle of a computer system. Why is it called a "life cycle" instead of just a "life"?
   ii. Define the system development life cycle phases as subsystems with inputs, process and outputs, naming the inputs and outputs for each.
   iii. What are the uses of an information system?
   iv. Why does a feasibility analysis necessary before designing a system?

2.
   i.   What is a prototype?
   ii. How can prototyping be used during the problem definition stage?
   iii. How can prototyping be used during the system design stage?
   iv. What are the advantages of prototyping?
   v.   Discuss the steps in the prototype method, indicating the expected outcome of each step.

3.
   i.   Differentiate between Entity Relationship Diagram (ERD) and Data Flow Diagram (DFD).
   ii. Differentiate among entity, record, key attribute and attribute.
   iii. Most data entities correspond to persons, objects, events or locations in the business environment. Give two examples of each data entity class.
   iv. Develop ER-diagrams for the following;

        a) Customer withdraws money from his account.
        b) Students write examinations.
        c) Students attend classes.
        d) Professors write books.
        e) Driver drives a car.

4.
i. What is a data flow? What is its relation to a process? To a data store?
ii. What is a context diagram?
iii. What do you understand by leveling of DFD?
iv. The following narrative explains the process of a student registration system. In this system, the Student Information is fed into the system. After the student information gets validated by the Data Entry and Validation process, the information is then passed to the Generate Student ID process, which generates a unique identification number for the student. This information is then saved in the Student database. Finally, the student information is printed on a student card using the Print Student Card process, which retrieves the student information from the student database. Draw a DFD for the above system.

5.

A University has the following rules for a student to qualify for a degree with Physics as the main subject and Mathematics as the subsidiary.

- Marks should be 50 percent or more in Physics and 40 percent or more in Mathematics
- If marks in Physics are less than 50 percent then marks in Mathematics must be 50 percent or more. However, Physics marks must be at least 40 percent.
- If marks in Mathematics are less than 40 percent but those in physics are 60 percent or more then only the examination in Mathematics has to be repeated.
- In all other cases the student fails.

i. Express the above statements in Structured English.
ii. Obtain a Decision table equivalent to the above rules.

6

An organization wants a program to obtain selective listings of various categories of its employees. An Employee File contains a record for each employee consisting of the employee's name, classification code and annual salary.

The program should request a classification code from an operator at a terminal. It is then required to read through the Employee File serially and print a report listing all of the employees with that code. At the end of the report, the program prints the total annual salary of the employees selected. The report should print up to 50 employees per page, each page numbered and suitably headed (including the selected classification code).

After printing the report, the program returns to the terminal operator and requests another code for another report. This procedure may continue until a code of zero is input by the operator.

Draw a structure diagram for this program.