

THE OPEN UNIVERSITY OF SRI LANKA
DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
B.S.C. DEGREE PROGRAMME 2015/2016
CSU3277: SOFTWARE ENGINEERING - FINAL EXAMINATION



Duration: Three Hours (3 Hrs.)

Date: 30th June 2016

Time: 1.00pm. to 4.00pm.

Answer FOUR (04) Questions ONLY.

Question 01

- (i) What is software?
- (ii) What are the main types of software? Briefly describe them.
- (iii) What are the problems encountered during the development of computer software?
- (iv) What are the six properties that good software should consist of? Briefly describe five of them.

Question 02

- (i) What is a software process?
- (ii) What are the software process models?
- (iii) Identify the five phases of the waterfall life cycle.
- (iv) What are the disadvantages of the waterfall method?

Question 03

- (i) Briefly explain the following terms.
 - a. Data flow
 - b. External entity
 - c. Process
 - d. Data store

- (ii) A system is to be built to assist Accounting and Business Information Systems (ABIS) to school administrative staff in the booking of classrooms. A more detailed description of the system is as follows.

The system is to accept classroom booking requests from ABIS administrative staff. When a request is received then it is checked to see whether all the required information is included (e.g. date, the details of the course, time and duration for which it is required, the number of students, facilities needed and so on). If the request is incomplete or invalid in some other way, then an "invalid request" message is sent to the requestor.

On the other hand, for a valid request, the booking file is used to generate a list of rooms that are available at the required date and time. If no rooms are available at that time, then a booking failure notice is sent to the requestor. If one or more rooms are available, these are then checked to see whether they are of sufficient size and have the facilities required. If it does not satisfy the conditions and if there are no suitable rooms, a booking failure notice is sent to the requestor.

Finally, if only one room is available, then it is booked. If more than one room is available, then a room that can accompany the total number of students is selected out of the available rooms and it is booked, and will be the smallest one out of the others. In either case, a booking confirmation notice is sent to the requestor as well as to the course lecturer giving the information about the room that has been booked.

Construct a Context Diagram and level zero Data Flow Diagram for the above class room booking system.

Question 04

- (i) What is a decision tree?
- (ii) There are different entrance rules for the Colombo Museum for different days of the week. Those rules differ among themselves depending on whether it is a national holiday or a non-holiday. Particularly, if you visit on a Saturday, which also happens to be a national holiday, do not bother to come because the museum is closed. But on other Saturdays you can use the Main Entrance. If you are visiting on a Sunday, the museum is again closed if it is a national holiday. But if not, you should use the Perera Mawatha for access. If you would like to visit on a regular weekday, use the Soysa Avenue entrance if it is a national holiday, if not use the Main Entrance.

Construct a decision tree using the above scenario.

Question 05

- (i) The following narration describes a process that determines whether a customer receives an item which has been ordered. Draw a suitable **Decision Table** for the above scenario. In this table, indicate all the rules that can be applied. *Hint: You may get 8 rules.*

If the ordered item is an item we stock, and the customer is an approved customer, and we have sufficient inventory on hand, then subtract the quantity ordered from the inventory count, send a shipment authorization for the item and quantity to shipping, and log this transaction. If the item is not something we stock, reject the order. If the customer is not an approved customer, reject the order. If we stock the item, and the customer is approved, but we have insufficient inventory to fill the order, then place this order on backorder, send a notice to that effect, and add this order to the follow-up log.

- (ii) Simplify the rules and obtain the reduced decision table.

Question 06

- (i)
- a) What is an Entity Relationship (ER) diagram?
 - b) Explain the following terms.
 - i. Entity
 - ii. Entity type
 - iii. Attributes
 - iv. Relationship
 - c) A team has players. The team has a unique team id, a name and a city. Each player belongs to only one team. Each player has a unique id, a name, a position and a skill level.

Draw an Entity Relationship Diagram including attributes and primary keys.

- (ii)
- a) What is prototyping?
 - b) What are the two (02) types of prototyping techniques? Briefly describe them.

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