

University of Swaziland

# Department of Computer Science

Supplementary/Re-sit Examination

2017/18

*Title of Paper: Software Engineering I/Practices in Software Engineering I*

*Course Number: CS451/CSC392*

*Time Allowed: Three (3) hours*

*Instructions: **ANSWER ALL QUESTIONS***

*You are not allowed to open this paper until you have been told to do so by the invigilator.*

## Question 1

a) A marketing company wishes to construct a decision table to decide how to treat clients according to three characteristics: [16]

- Gender
- City Dweller
- Age group: A (under 30), B (between 30 and 60), C (over 60)

The company has four products (W, X, Y and Z) to test market.

- Product W will appeal to male city dwellers.
- Product X will appeal to young males.
- Product Y will appeal to female middle aged shoppers who do not live in cities.

Product Z will appeal to all but older males.

b) How is a structure chart different from a structure diagram? [3]

c) Name the types of relationships that may exist between entities in an ER diagram. [4]

d) Discuss the two (2) activities that involve using the ER model. [2]

## Question 2

a) Using Data Flow modeling involves a number of activities, discuss them. [5]

b) Draw a physical DFD for the scenario below. [7]

### 4REAL TRAVELS

Mxolisi receives customer travel request. If rail travel is requested, he forwards it to Melusi and Air travel request are forwarded to Mlungisi. Melusi and Mlungisi process request by consulting the rail and airline operators and looking at the timetable and fares tables. These tables are written on paper. For travel request that can be met a travel ticket is produced.

- c) Draw a logical DFD for the scenario below. [13]

### **PIZZA SUPREME**

A large pizza business makes pizzas and sells them. The pizzas are manufactured and kept in cold storage for not more than two weeks.

The business is split into a number of functional units. There is Production Control, Manufacturing, Stores, Accounts, Sales, Shipping and Purchasing. Production Control are responsible for organising which pizzas to produce in what order and in what quantity. They need to schedule the production of the pizzas according to the current and expected sales orders together with the number of pizzas already in Stores. Manufacturing take the raw materials from the Stores and manufacture pizzas returning the completed goods to the Stores. Accounts deal with the payments for the pizzas when delivered to the customer and the payment to the suppliers of the raw materials. Sales deal with customer orders whilst Purchasing organise the buying of raw material from suppliers. Shipping manage the packing and delivery of the goods to the customer with a delivery note.

When a sales order is received by sales they record what is being ordered and by whom. They also record the details of the expected date of delivery. Production Control accesses this information and makes sure that, if required, pizzas are produced by Manufacturing and are ready in Stores for when the delivery needs to be made.

After the delivery is made Accounts make sure that the customer receives an invoice and that payment for the invoice is received at which time a receipt is issued. Purchasing looks at the current stock of raw materials and by using current stock levels, supplier turnaround times and quantity to be ordered decide what needs to be ordered on a daily basis. Their aim is never to run out of an ingredient but to minimise the amount of raw material kept in stock.

### **Question 3**

- a) Draw a decision tree and table for the case below.

**Product decision.** To absorb some short-term excess production capacity at its plant, Special Instrument Products is considering a short manufacturing run for either of two new products, a temperature sensor or a pressure sensor. The market for each product is known if the products can be successfully developed. However, there is some chance that it will not be possible to successfully develop them. Revenue of E1,000,000 would be realized from selling the temperature sensor and revenue of E400,000 would be realized from selling the pressure sensor. Both of

these amounts are net of production cost but do not include development cost. If development is unsuccessful for a product, then there will be no sales, and the development cost will be totally lost. Development cost would be E100,000 for the temperature sensor and E10,000 for the pressure sensor. [10+7]

b) Draw a PERT diagram for the project below. [8]

Activity ID	Description of Activity	Predecessor	Duration (Months)
XX1	Contract signing	None	1
XX2	First consultations	XX1	2
XX3	Team hiring	XX1	3
XX4	OSD discussion	XX2, XX3	2
XX5	Modules splitting	XX4	3
XX6	Assignments	XX5	2
XX7	Start documentation	XX4	1
XX8	Module development 1	XX6	2
XX9	Module development 2	XX6	3
XX10	Module development 3	XX6	2
XX11	Integration	XX8, XX9, XX10	2
XX12	Test	XX8, XX9, XX10	3
XX13	Final integration	XX11, XX12	2
XX14	Final test	XX13	2
XX15	Final documentation	XX7, XX14	3

#### Question 4

- a) Discuss the sequential and waterfall models. [8]
- b) Name and discuss four maintenance activities. [8]
- c) What is the main purpose of normalization? [2]
- d) Discuss prototyping. [7]

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