



UNIVERSITY
of
TECHNOLOGY,
MAURITIUS

BSc (Hons) Software Engineering

Cohorts: BSE/20A/FT

Examinations for 2022/ Semester 1

Resit Examinations for BCNS/20B/FT & BWT/17B/FT

MODULE: ANALYSIS AND DESIGN

MODULE CODE: SDT2101C

Duration: 2 ½ Hours

Instructions to Candidates:

1. Answer **all** questions. Questions do not carry equal marks.
2. Questions may be answered in any order but your answers must show the question number clearly.
3. Always start a new question on a fresh page.
4. Total marks 100.

This question paper contains 4 questions and 4 pages.

ANSWER ALL QUESTIONS

CASE STUDY: Coronavirus Outbreak

Due to the outbreak of Coronavirus, Mauritius has been in lockdown for a month starting from the 18th of March 2020. The population has been discouraged to go out to prevent the spread of the virus. People will need food and medicine. Company XYZ has come forward with a brilliant solution to help the Mauritian citizen to buy food, medicine or other stuff without leaving their homes. The company XYZ has developed a web application for those who have internet access. For those without internet, the company is proposing a food caravan.

Through the web application, a customer can view any item he/she wants to purchase but he/she needs to register first. Once registered, he/she can log on. He/She can add to their personal basket. He/She make an online payment by specifying the delivery address. Each purchase is properly labelled with the purchaser's name and delivery address. The customer can also request an item not available from the list.

The system keeps a list of suppliers and related items they sell. Suppliers may be retail shops, supermarkets, pharmacies and other appliances shops. Suppliers must register. They can propose a list of items for sale. Suppliers can view their sales figures online. They can also view detailed sales.

The food caravan is a small retail shop. There will be few caravans operating in different regions of the country each day. The schedule of each caravan will be decided one day before. They will sell only basic food stuffs. For each caravan, a driver and a helper will be responsible for the sale and delivery. The caravan is equipped with a tablet with internet access. The driver or helper will quickly register a client. The client will be asked which item he/she wants to buy. All this information will be fed to the web application instantly. The client can pay cash or with cards. People can also request items not available in the caravan. The next time, a caravan may bring the item requested by potential clients. Each caravan will be equipped with a GPS system. The admin staff can have real-time tracking of the caravans. Admin staff can update the system for a new schedule of a particular caravan. The admin staff can view daily sales.

QUESTION 1: (57 MARKS)

Refer to the Case Study:

- (a) What is the purpose of a use case diagram? **(3 Marks)**
- (b) Draw a use case diagram for the above case study. You may consider other features not mentioned in the case study **(35 Marks)**
- (c) Write the use case specification for any of the above uses cases. **(7 Marks)**
- (d) Draw an appropriate class diagram. **(12 Marks)**

QUESTION 2: (14 MARKS)

Describe a sequence diagram? Illustrate your answer with a diagram related to the case study. **(14 Marks)**

QUESTION 3: (19 MARKS)

- (a) Why is a feasibility study important? **(2 Marks)**
- (b) Complete the table below and compute the exact payback period. **(8 Marks)**

Cash Flow Description	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Development Costs	(418000)	0	0	0	0	0	0
Operation and Maintenance Costs	0	(15045)	(16000)	(17000)	(18000)	(19000)	(20000)
Discount factors for 12%	1	0.893	0.797	0.712	0.636	0.567	0.507
Present Value of annual cost							
Cummulative Costs							
Benefits	0	150000	170000	190000	210000	230000	250000
Present value of annual Benefits							
Cummulative Benefits							
Net Cost+Benefits							

(c) Briefly explain the main causes of software failures. **(5 Marks)**

(d) Explain briefly why the interview process is important while gathering facts for a particular company or client? **(4 Marks)**

QUESTION 4: (10 MARKS)

(a) What must we ensure before implementation (installing the new software at the client's site)? **(6 Marks)**

(b) What must we ensure after implementation? **(4 Marks)**

*****END OF QUESTION PAPER*****