SEMESTER 2
2022-2023

CS335FZ
Software Engineering & Software Process

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Time allowed: 2 hours

Answer at least ***three*** questions
Your mark will be based on your best ***three*** answers

All questions carry equal marks

Instructions

	Yes	**No**
Log Books Allowed		X
Formula Tables Allowed		X
Other Allowed (*enter details)*		X

General (*enter detail)*

QUESTION 1 (20 marks)

(a) Describe the seven phases of ***The waterfall model***. (4 marks)

(b) Based on your own knowledge of some of the application types, explain, with examples, why different application types require specialised software engineering techniques to support their design and development. (6 marks)

(c) Draw a class diagram (for an application consisting of an Ordering system) considering all the following points. (10 marks)

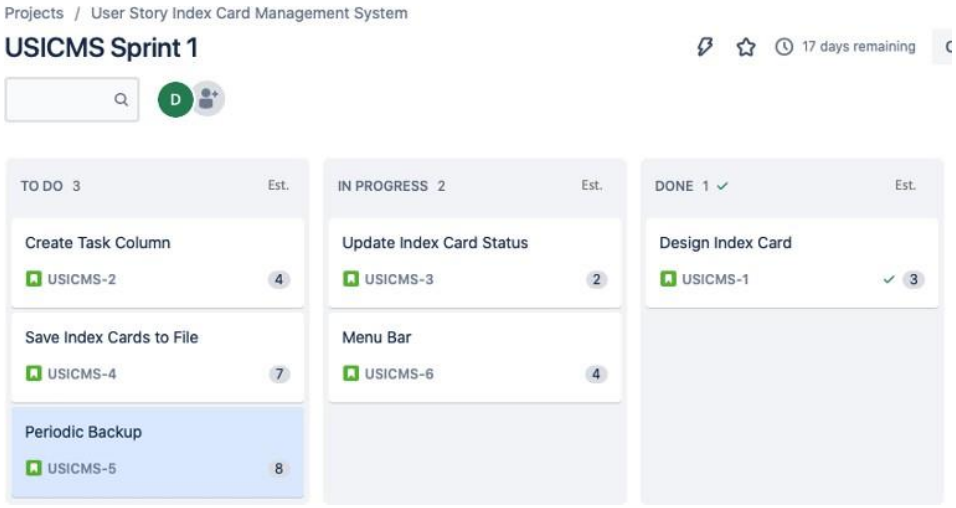
First of all, Order and Customer are identified as the two elements of the system. They have a one-to-many relationship because a customer can have multiple orders.

Order class is an abstract class and it has two concrete classes (inheritance relationship) SpecialOrder and NormalOrder.

The two inherited classes have all the properties of the Order class. In addition, they have additional functions like dispatch () and receive ().

QUESTION 2 (20 marks)

(a) In Scrum, a Burndown chart is frequently used for monitoring the development progress within a Sprint. Given a 4-week Sprint development and the Sprint status as shown in the figure below, draw a Burndown chart for the Sprint. (8 marks)



(b) Identify six ambiguities in the following statement of requirements for part of a ticket issuing system. (12 marks)

An automated ticket-issuing system sells rail tickets. Users select their destination and input a credit card and a personal identification number. The rail ticket is issued, and their credit card account is charged. When the user presses the start button, a menu display of potential destinations is activated, along with a message to the user to select a destination.
Once a destination has been selected, users are requested to input their credit card. Its validity is checked, and the user is then requested to input a personal identifier. When the credit transaction has been validated, the ticket is issued.

QUESTION 3 (20 marks)

(a) Given a project schedule as shown in the table below, build the activity network for the project schedule and identify the critical path in the activity network. (10 marks)

Task	Duration	Dependencies
T1	7	
T2	12	
T3	16	T1
T4	9	
T5	10	T2, T4
T6	5	T1, T2
T7	17	T1
T8	26	T3, T6
T9	14	T5, T7
T10	10	T9

(b) Consider the statement "testing can only detect the presence of error, not their absence". Do you agree with this statement? If yes, explain why. If not, use an example to show how it is contradicted. (6 marks)

(c) Explain the term software maintenance. (4 marks)

QUESTION 4 (20 marks)

(a) Develop a sequence diagram showing the interactions involved when a student registers for a course at a university. Courses may have limited enrolment, so the registration process must include checks to ensure that a sufficient number of places are available. You can assume that the student will access an electronic course catalogue to learn about available courses. (8 marks)

(b) Suggest an architecture for a system (such as iTunes) that sells and distributes music on the internet. What architectural patterns are the basis for this architecture you propose? Explain your answer. (4 marks)

(c) A small company has developed a specialised product configuration tailored for each customer. New customers usually have specific requirements to be incorporated into their system, and they pay for these to be developed. The company has an opportunity to bid for a new contract, and this could more than double its customer base. The new customer also wishes to have some involvement in the system's configuration. Explain why, in these circumstances, it might be a good idea for the company owning the software to make it open source. (8 marks)