

CS3004 Software Design and Analysis (Objective Solution)

Saturday, December 24, 2022

Course Instructors

Dr. M. Bilal, Ms. Pariwish Touseef

Serial No:

Final Term Exam

Total Time: 40 Mins

Total Marks: 20

Signature of Invigilator

Roll No

Section

Signature

DO NOT OPEN THE QUESTION BOOK OR START UNTIL INSTRUCTED.

Instructions:

1. Verify at the start of the exam that you have a total of **five (5)** questions printed on **five (5)** pages including this title page.
2. Attempt all questions on the question-book and in the given order.
3. The exam is closed books, closed notes. Please see that the area in your threshold is free of any material classified as 'useful in the paper' or else there may a charge of cheating.
4. Read the questions carefully for clarity of context and understanding of meaning and make assumptions wherever required, for neither the invigilator will address your queries, nor the teacher/examiner will come to the examination hall for any assistance.
5. Fit in all your answers in the provided space. You may use extra space on the last page if required. If you do so, clearly mark question/part number on that page to avoid confusion.
6. Use only your own stationery and calculator. If you do not have your own calculator, use manual calculations.
7. Use only permanent ink-pens. Only the questions attempted with permanent ink-pens will be considered. Any part of paper done in lead pencil cannot be claimed for checking/rechecking.

	Q-1	Q-2	Q-3	Q-4	Q-5	Total
Total Marks	5	4	4	4	3	20
Marks Obtained						

Vetted By: _____ Vetter Signature: _____

University Answer Sheet Required: No ☐ Yes ☐

Question No.1

(5 Marks)

Indicate whether or not the diagram displays the information described in the first column. Y = info is displayed, N = info is not displayed, blank = could be answered either way.

Displayed Information	Use case	Activity	Class	Sequence	State chart
system users					
sequence of operations					
guard conditions					
logic of operations					
static view of the system					

Solution

Indicate whether or not the diagram displays the information described in the first column.

displayed information	use case	activity	class/object	collaboration	sequence	statechart
system users	Y	Y	N	Y	Y	N
sequence of operations	N	Y	N	Y	Y	
guard conditions		Y	N	Y	Y	Y
logic of operations	N	Y	N	N	N	N
static view of the system	Y	N	Y	N	N	

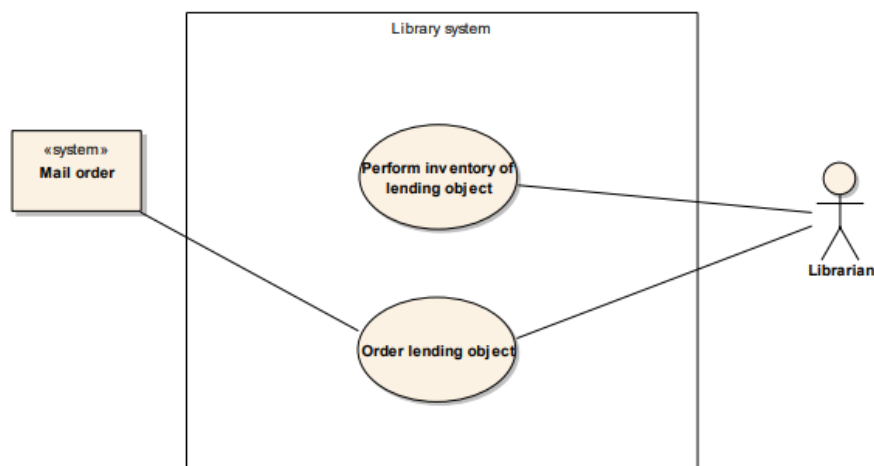
Y = info is displayed, N = info is not displayed, blank = could be answered either way

Also allow tic for Y, cross for N and B for blank.

Question No.2

(4 Marks)

A library system allows a user (librarian) to take an inventory of the lending objects. This library system also allows the user to order lending objects via an externally connected system. Assume the following use case diagram:



Your task is to add new functionalities to the use case diagram. Which of the following possible extensions of the system would you model in the use case diagram? Mark it in tic or cross.

		Tic/Cross
1.	The "Mail order" system must send a dispatch confirmation	X

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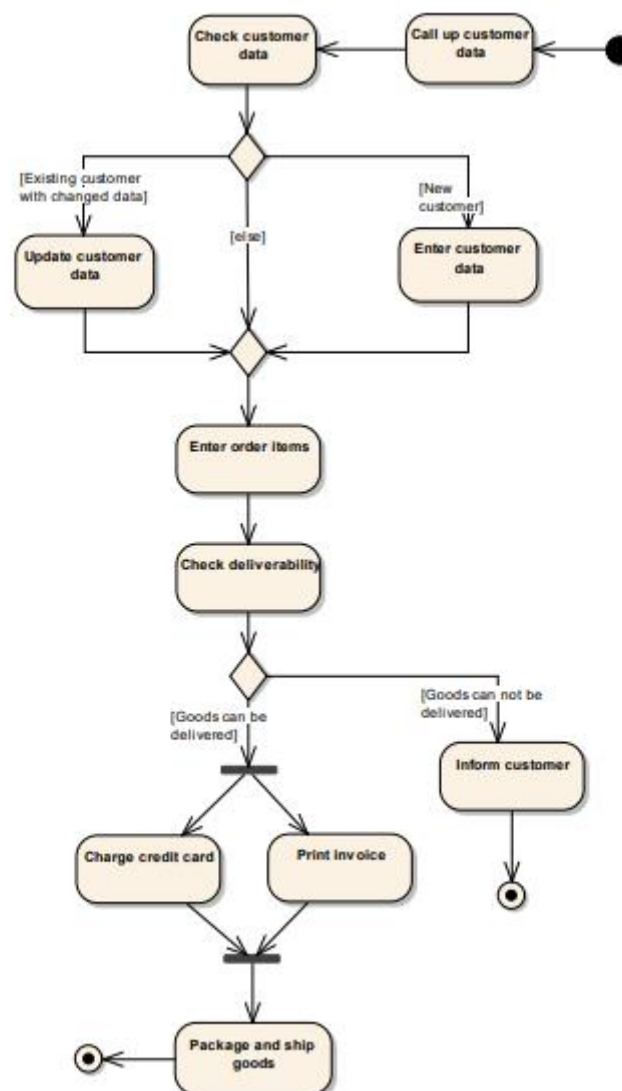
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2.	The library system must allow the librarian to categorize lending objects retrospectively.	✓
3.	For "Order lending object", the librarian must always specify a delivery address for the library.	X
4.	When performing an inventory, the librarian can adopt an automatically proposed inventory number or change it manually.	X

Question No.3

(4 Marks)

A shipping company processes orders according to the activity diagram shown below. Please check the statements listed and decide whether they are correct or not correct with reference to the activity diagram.



		Correct/Not Correct
1.	The customer data is always updated before an order is recorded.	Not Correct
2.	If the goods cannot be delivered, the customer is informed and the order is not executed.	Correct
3.	If the goods can be delivered, first the credit card is charged and then an invoice is printed.	Not Correct

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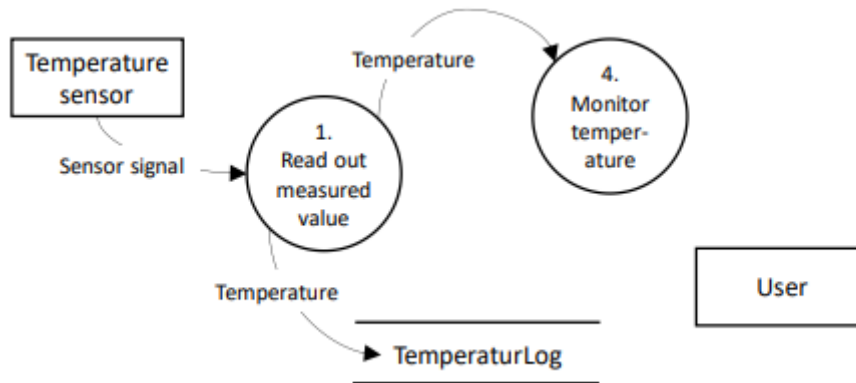
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4.	The goods are packaged and shipped if at least one of the activities (credit card charged, invoice printed) is executed successfully.	Not Correct
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Question No.4

(4 Marks)

Your task is to add the processes "Shut down computer" and "Display temperature progression" to the given diagram based on the following information: The process "Display temperature progression" reads the current temperature from the temperature log and displays it to the user as a "Temperature curve". The process "Monitor temperature" delivers a "Shutdown signal" to the process "Shut down computer". The process "Shut down computer" then issues a message to the user. Assume the following data flow diagram:



Which is the correct and not correct, but not necessarily complete, extension of the given data flow diagram?

		Correct/Not Correct
1.	<ul style="list-style-type: none"> • An additional process "Display temperature progression" • A data flow "Temperature curve" from the data store "Temperature log" to the terminator "User" • A data flow "Shutdown signal" from the process "Monitor temperature" to the process "Shut down computer" • A data flow "Message" from the process "Shut down computer" to the terminator "User" 	Not Correct
2.	<ul style="list-style-type: none"> • Two additional processes "Display temperature progression" and "Shut down computer" • A data flow "Shutdown signal" from the process "Monitor temperature" to the process "Shut down computer" • A data flow "Message" from the process "Shut down computer" to the terminator "User" • A data flow "Temperature curve" from the process "Display temperature progression" to the terminator "User" 	Correct
3.	<ul style="list-style-type: none"> • An additional terminator "Display temperature progression" • A data flow "Shutdown signal" from the process "Monitor temperature" to the process "Shut down computer" 	Not Correct

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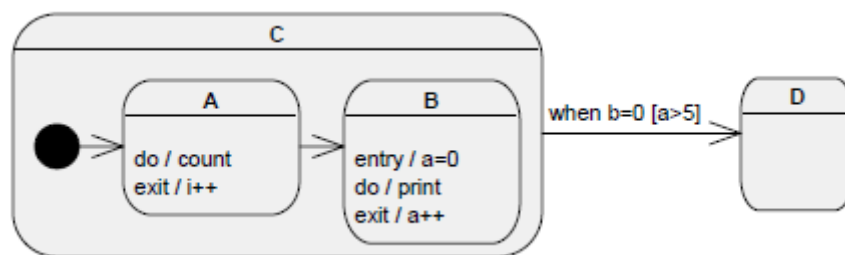
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	<ul style="list-style-type: none"> • A data flow "Message" from the process "Shut down computer" to the terminator "User" • An additional terminator "Monitor temperature" • A data flow "Temperature curve" from the process "Display temperature progression" to the terminator "User" 	
4.	<ul style="list-style-type: none"> • An additional terminator "Shut down computer" • An additional process "Display temperature progression" • A data flow "Shutdown signal" from the process "Monitor temperature" to the terminator "Shut down computer" • A data flow "Message" from the terminator "Shut down computer" to the terminator "User" 	Not Correct

Question No.5

(3 Marks)

You are given the following state machine diagram. Assuming the active state is state A, event $b=0$ occurs and $a>5$ evaluates true, what happens? Which is the correct and not correct ?



		Correct/Not Correct
1.	As soon as the <code>exit</code> -activity of state A is completed, D becomes the next active state. If <code>do</code> -activities are currently executed, they are terminated.	Correct
2.	As soon as the <code>exit</code> -activity of state D is completed, D becomes the next active state.	Not Correct
3.	As soon as all activities from state A and B are completed, D becomes the next active state.	Not Correct