Question Paper

Exam Date & Time: 06-Jan-2023 (02:30 PM - 05:30 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

V Semester Makeup Examination Software Design Technology

SOFTWARE DESIGN TECHNOLOGY [ICT 3174]

Duration: 180 mins.

Descriptive Questions

Answer all the questions.

Marks: 50

Section Duration: 180 mins

- What are the tradeoffs proposed by the "Manifesto for Agile Software Development"? Explain an (5) agile process model that emphasizes the use of a set of software process patterns with its framework activities and development actions.
 - B) For given scenario/problem statement, draw the swimlane diagram with the model elements that (3) you find appropriate.

The client and server are the two modules, where server will produce the services requested by the client. Initially the server will be in the listen mode. Being in the listen mode the server may get a client's IP address. The server validates the IP address sent by the client. The server will be in the accepted stage and wait for the filename which wants to be downloaded. On receiving a file-name server starts downloading. The size of the file is 50 Mbs. Due to some technical problem the server may be down after successful download of 30 Mbs so that downloading of a file will be stopped else download will continue till the end of file. On server recovery, due to the installed download manager software the downloading of a file will start from the broken or paused downloads and continues till the end of file.

- C) Describe the primary determinants for software quality and organizational effectiveness. (2)
- 2) Draw the use-case diagram for the following problem statement and write system name, primary (5) actors, secondary actors, and the main scenario from user point of view.
 - A) Individuals can use an app to place food orders directly to restaurants. The user browses restaurant options. Once the preferred restaurant is selected, they place an order through the application. When the user places an order, they are prompted to pay through the app or pay when the food arrives. The user pays online or verifies they will pay in person. Once that is confirmed, the restaurant will receive a request through their system. The food will then be prepared, packaged, and delivered to the individual. In this case, the app must be able to receive orders, process payments, and communicate with the restaurant electronically. The order is sent from the app to the restaurant's internal system. The restaurant worker receives and processes the electronic order.
 - B) Why and how do you normalize software measures? Explain with an example. (3)
 - C) When Drivers and Stubs are used in testing? Which types of testing/approach leads to creating (2) more stubs?
- 3) Design the test cases for the following code snippet using path testing. You are expected to follow (5) the following steps to design an effective test case which have a high probability of revealing defects.
 A)
 - 1. Draw the CFC (Control Flow Graph)

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2. Find the Cyclomatic Complexity using three methods.
3. Identify the independent paths (Basic Path Set)
4. Derive test cases
int main()
int arr[50], i, j, n, temp;
printf("Enter total number of elements to store: ");
scanf("%d", &n);
printf("Enter %d elements:", n);
for(i=0; i< n; i++)
scanf("%d", &arr[i]);
printf("nSorting array using bubble sort technique...n");
for(i=0; i< (n-1); i++)
{
for(j=0; j< (n-i-1); j++)
{
if(arr[j]>arr[j+1])
{
temp = arr[j];
arr[j] = arr[j+1];
arr[j+1] = temp;
}
}
}
printf("All Array elements sorted successfully!n");
printf("Array elements in ascending order:nn");
for(i=0; i< n; i++)
printf("%d ", arr[i]);
getch();
return 0;
}
What do you mean by requirements validation and requirements management? Describe the quality (3)
management technique for requirement elicitation, which translates the needs of the customer into
technical requirements for software.
List three characteristics that can serve as a guide to evaluate design quality. Explain how effective (2)
modular design is achieved through functional independence of the individual modules.
Write the sequence diagram for a Place Order Scenario pertaining to online shopping described
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B)

C)

4)

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Page 2 of 3
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(5)

below.

	A)	A member of a ship who would like to place an order online. The item ordered will be sent to the member either send by courier or by ordinary mail depending on the member status (VIP, Ordinary membership). Optionally, the shop will send the member a confirmation notice if the member opted for the notification option in the order.	
	В)	Consider a software project with five tasks T1-T5. The duration of these five tasks in days is 21, 14, 7, 35, and 14. T2 and T4 can start when T1 is complete. T3 can start when T2 is complete. A T5 can start when both T3 and T4 are complete.	(3)
		Draw the activity on node chart of the project. Determine Earliest Start (ES), Earliest Finish (EF), Latest Start (LS), Latest Finish (LF), and slack times for every task in sequence. Which tasks are on the critical path?	
	C)	How synchronization of parallel activities can be achieved in activity diagram? Explain with a suitable example.	(2)
5)		Compute the function point, productivity, documentation, and cost per function for the following data:	(5)
	A)	Number of user inputs (average complexity with a weighting factor of 4) = 24	
		Number of user outputs (simple complexity with a weighting factor of 4) = 46	
		Number of inquiries (complex complexity with a weighting factor of 6) = 8	
		Number of files (average complexity with a weighting factor of $10) = 4$	
		Number of external interfaces (simple complexity with a weighting factor of 5) = 2	
		Effort = 36.9 p-m	
		Technical documents = 265 pages	
		User documents = 122 pages	
		Cost = \$7744/ month	
		Various processing complexity factors are: 4, 1, 0, 3, 3, 5, 4, 4, 3, 3, 2, 2, 4, 5.	
	B)	Design the test cases for the below specification using equivalence class partitioning and boundary value analysis (if applicable).	(3)
		Specification:	
		Input is length of three sides of a triangle: a, b, c	
		Output true if each side is a positive number less or equal to 20	
		and the triangle is Isosceles (2 sides are equal), false otherwise.	
		Precondition: the sides form a triangle.	
	C)	What is W ⁵ HH principle? Explain.	(2)

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