MANIPAL INSTITUTE OF TECHNOLOGY, MANIPAL 576104

(Constituent College of Manipal University)

SECOND SEMESTER M.Tech (Software Engg.) DEGREE END SEMESTER EXAMINATION MAY - 2016
SUBJECT: SOFTWARE TESTING – ICT 522
(REVISED CREDIT SYSTEM)

| TIME: 3 HOURS | 05/05/2016 | MAX. MARKS: 50 |

Instructions to candidates
- Answer any **FIVE FULL** questions.
- Missing data, if any, may be suitably assumed.

1A. Draw Data Dependency Graph, define slices and sensitize the paths and loops for the following code snippet shown in figure Q.1A

void pow (int x, y)
{
float z;
int p;
if (y < 0)
p = 0 – y;
else p = y;
z = 1.0;
while (p != 0)
	{
	z = z * x;
	p = p – 1;
	}
	if (y < 0)
	z = 1.0 / z;
	printf(z);
	}

Figure Q.1A

1B. Explain the difference between equivalence class testing and input domain partitioning with suitable example.

1C. Differentiate between Verification and Validation with respect to defect identification.

(5+3+2)

2A. Write the pseudo code for the Insertion sort and do the following:
  i) Draw the Control Flow Graph and calculate the Cyclomatic Complexity.
  ii) Design the test cases for all the independent paths.

2B. Explain Generic testing process with neat diagram and major activities.

2C. Explain the two usage models of Usage Based Statistical Testing.

(5+3+2)

3A. Perform UMM based testing for the following problem statement and sensitize all the states and transitions.

An online railway reservation consists of the following activities. A Passenger can reserve a ticket, cancels a ticket and enquiry. Each train has limited number of reserved seats. Once a passenger cancels a ticket, required amount is deducted and the waiting list passenger is allotted the seat. Passenger may also book a ticket in tatkaal scheme by paying additional amount. Passenger who booked the ticket under tatkaal scheme can't get any refund if the ticket is cancelled. The chart is prepared two hours before the departure of the train. Write test case sensitization with respect to "Passenger" operational profile.

3B. Compare Coverage Based Testing and Usage Based Statistical Testing with respect to objects, timeline and defect detection.

3C. Explain the used of N-Version programming in fault tolerance.

(5+3+2)

4A. Draw Cause Effect Graph to identify whether the given nXn matrix is a magic square or not. Write decision table and test cases for the same.

4B. What is an Oracle problem? Design an Oracle for following problem statement. Can this oracle be automated?

Consider a website that allows its visitors to search for items in a database using arbitrary search strings. Consider main three operations: Search, Previous and Next. To invoke the search operation, a search string is typed and a search button clicked. When search results are displayed, the Previous and Next buttons show up and may be clicked to move to the previous and next page of search results.

4C. List the phases of Personal Software Process with a neat diagram.

(5+3+2)

5A. Explain in detail five levels of Capability Maturity Model with suitable diagram and related KPAs.

5B. Explain EPC and weak NX1 strategies for the input domain $(0<=x<21)$. Also, explain which problems cannot be detected by these domain strategies.

5C. Explain Integrated Hierarchical Strategy for Web Testing.

(5+3+2)

6A. Identify the two invariants, two pre-conditions and two post-conditions from below problem statement and Write using Object Constraint Language. (Mention suitable assumptions)

Supermarket requires stock control system to void out of stock level for each product. A purchasing_admin will be able to process an order by entering product numbers and required quantities into the system. The system will display a description, price and available stock. In-stock products will normally be collected immediately by the customer from the store. If stock is not available the purchasing_admin will be able to create a backorder for the product. The system will allow products to be paid by cash. Order details for in-stock products will be printed including the quantity, product number and description. The store manager will be able at any time to print a summary report of sales in the store for a given period, including assignment of sales to sales assistants in order to calculate weekly sales. The stock manager will be able to monitor stock levels and weekly run-rates in order to set minimum stock levels and requisition products which fall below the minimum stock levels or for which demand is anticipated. When the stock arrives it will be booked in by the warehouse person. Stock that has been backordered for collection from the store is held in a separate area and the store manager advised of its arrival. The catalogue of available products will be maintained remotely.

6B. Explain the steps of Fagan Inspection and bring out advantages and disadvantages as compared to other inspection techniques.

6C. Bring out the benefits of the testing techniques listed below.

    i) Smoke Testing   ii) Regression Testing

(5+3+2)

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