Nirma University

Institute of Technology

Semester End Examination (IR), December 2021

B. Tech. in Computer Science & Engineering, Semester-VII

2CSDE80 SOFTWARE TESTING AND QUALITY ASSURANCE

Roll / Exam No.		Supervisor's initial with date	

Time: 2 Hours | Max. Marks: 50

Instructions:
1. Attempt all questions.
2. Figures to right indicate full marks.
3. Draw neat sketches wherever necessary.
4. Attempt questions in sequence only.

Q-1. **Do as directed:** **[16]**

A CO4BL3 In the following series of application examples, provide four most important quality attributes for acceptance criteria that you think are critical to the applications and also justify each. [05]

(a) Telecommunication software
(b) Video game software
(c) Intrusion detection system software
(d) Medical diagnostic software for assisting doctors
(e) Highly popular music download website

B CO1BL4 Identify the similarity between software safety and fault tolerance? Differentiate between performance, stress, and scalability testing? [05]

C CO1BL2 What do you mean by the gap between all-branches testing and all-paths testing and how does data flow testing fill this gap? [06]

Q-2. **Do as directed:** **[16]**

A CO2BL5 Consider a program for determining the Previous date. Its input is a triple of day, month and year with the values in the range. [05]

$1 \leq$ month ≤ 12, $1 \leq$ day ≤ 31, $1900 \leq$ year ≤ 2025

The possible outputs would be Previous date or invalid date. Design the boundary value test cases.

B CO4BL2 List out the similarities and differences between quality assurance and safety assurance by considering certain scenarios? [05]

C CO2BL1 Why should integration testing be performed? What types of errors can this phase of testing reveal? [06]

OR

C CO2BL3 Suppose that you plan to purchase COTS components and integrate them with your communication software project. What kind of acceptance criteria will you develop to conduct acceptance testing of the COTS components? [06]

Q-3. **Do as directed:** **[18]**

A CO3BL4 Explain the difference between coverage metrics and traceability matrix with help of suitable example. [05]

B **CO3BL4**	What is the purpose of having a system test plan ready before the start of system test cycles? Why are multiple test environments set up for the execution of system-level test cases? Why should these test environments not be shared for software development activities?	[05]
C **CO2BL6**	Consider the openfiles( ) function as shown below, which has three statements: an assignment statement int i = 0;, a conditional statement if( ), and a return(i) statement. The reader may note that irrespective of the evaluation of the if( ), the function performs the same action, namely, null.	[08]

```
FILE *fptr1, *fptr2, *fptr3; /* These are global variables. */
int openfiles( ) {

/*This function tries to open files "file1", "file2", and "file3" for read
access, and returns the number of files successfully opened. The file
pointers of the opened files are put in the global variables. */

int i = 0;
if(
((( fptr1 = fopen("file1", "r")) != NULL) && (i++)
&& (0)) ||
((( fptr2 = fopen("file2", "r")) != NULL) && (i++)
&& (0)) ||
((( fptr3 = fopen("file3", "r")) != NULL) && (i++))
);
return(i);
}
```

Answer the following questions refer to the above code only:

(a) Draw a CFG.

(b) From the CFG, identify a set of entry–exit paths to satisfy the complete statement coverage criterion.

(c) Identify additional paths, if necessary, to satisfy the complete branch coverage criterion.

(d) For each path identified above, derive their path predicate expressions.

OR

C **CO2BL6**	Let us consider the following description of a payment procedure: (a) Consultants working for more than 40 hours/week are paid at their hourly rate for the first 40 hours and at two times their hourly rate for subsequent hours. (b) Consultants working for less than 40 hours / week are paid for the hours worked at their hourly rates and an absence report is produced. (c) Permanent workers working for less than 40 hours a week are paid their salary and an absence report is produced. (d) Permanent workers working for more than 40 hours a week are paid their salary. Describe the above payment procedure using a decision table and generate test cases from the table.	[08]