Register No: …………………          Name: ..................................................................

# SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)
### (AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)
## EIGHTH SEMESTER B.TECH DEGREE EXAMINATION(R), MAY 2024
## Computer Science and Engineering
## (2020 SCHEME)

| | | | |
|---|---|---|---|
| **Course Code** | : | **20CST456** | |
| **Course Name** | : | **Software Testing** | |
| **Max. Marks** | : | **100** | **Duration:3 Hours** |

## PART A
### (Answer all questions. Each question carries 3 marks)

1. Distinguish between level 1 and level 2 testing levels?

2. Discuss some errors in software testing?

3. What is meant by functional program testing?

4. A software engineering group is developing a mission-critical software system that will launch laser-guided missiles to its destinations. This is a new kind of product that was never built by the company. As a quality assurance manager, which code review methodology would you recommend? Justify your answer.

5. What do you understand by the term coupling du-pairs?

6. What are call graphs? How method implementation is effectively performed using call graph?

7. Differentiate between interface and functionality based approaches.

8. Define All Combination Coverage and Each Choice Coverage

9. Discuss Matrix testing with an example.

10. Explain about Orthogonal Array Testing.

## PART B
### (Answer one full question from each module, each question carries 14 marks)
### MODULE I

11. Explain the following types of testing          14
    (i) Black Box testing (ii) White Box testing (iii) GreyBox testing (iv) Unit testing (v) Integration testing (vi) System testing (vii) Acceptance testing

### OR

12. a. Explain the following coverage criteria based on the code fragment given below?    8
    (i) Functional coverage (ii) Statement coverage (iii) Conditional coverage (iv) Branch coverage

    ```
    int foo (int x, int y)
    {
        int z = 0;
        if ((x > 0) && (y > 0)){ z = x;}
    ```

```
        return z;
    }
```

b. Write positive and negative test cases for an ATM Machine?                                      6

## MODULE II

13.    a. Explain in detail, the steps in mutation testing.                                         9
       b. Write notes on JUnit.                                                                     5

**OR**

14.    Explain dynamic unit test in detail.                                                        14

## MODULE III

15.    a. Explain touring, side trips and detours with the help of suitable examples.              6
       b. Explain simple path coverage and prime path coverage with the help of the CFG below:     8
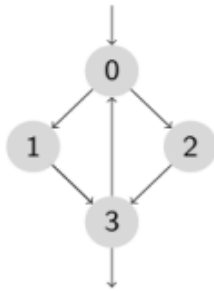


**OR**

16.    Draw CFG for i) if-else ii) while iii) for iv)switch v)try-catch vi) simple if vii) do while by   14
       giving simple pseudocodes.

## MODULE IV

17.    a. Explain the steps in functional testing.                                                 7
       b. Discuss the functional testing concept of Howden.                                        7

**OR**

18.    Write short notes on various types of functional testing techniques.                        14

## MODULE V

19.    Explain the concept of Symbolic Execution. Consider a case study and show its implementation   14
       and draw the symbolic execution tree.

**OR**

20.    Consider the code fragment given below: -
       1. POWER: PROCEDURE(X, Y);
       2. Z ← 1;
       3. J ← 1;
       4. LAB: IF Y ≥ J THEN
       5. DO; Z← Z * X;
       6. J ← J + 1;
       7. GO TO LAB; END;
       8. RETURN (Z) ;
       9. END;

       a. Explain Symbolic execution of POWER ($\alpha l$, $\alpha 2$).                            7
       b. Explain Execution tree for POWER ($\alpha l$, $\alpha 2$).                                7


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```