

M.Tech (CSE) 3rd Sem-2019**Sub: Software Testing****Time: 3 Hours****Full Mark: 70****(Answer all questions and the figures in the right hand margin indicates marks)**1 . [14]

Differentiate between error, bug, and fault. Draw and explain the software testing life cycle. Explain the goals of Software Testing.

OR

Explain all types of Boundary Value analysis techniques. A program calculates the GCD of three numbers in the range [1, 50]. Design test cases for this program using BVC, robust testing and worst-case testing methods.

2 . [14]

Differentiate between black-box and white-box testing. What is the role of mutation testing in developing quality software? Explain the process of mutation testing along with its types.

OR

Explain difference coverage based testing techniques with examples. Draw the control flow graph for the following program segment. From the control flow graph, determine its Cyclomatic complexity.

```
int find-maximum(int i, int j, int k)
{
    int max;
    if(i>j) then
        if(i>k) then max=i;
        else max=k;
    else if(j>k) max=j;
    else max=k;
    return(max);
}
```

3.

[14]

Explain the use of Cause-Effect graph in generating test cases. Describe any five notations used in Cause-Effect graph. A program has been designed to determine the roots of a quadratic equation. The quadratic equation takes three input values from the range [0, 50]. Design the cause-effect graph for this program.

OR

How black-box testing is helpful? Consider the payroll system of a person. If the salary of a person is less than equal to Rs. 70,000 and expenses do not exceed Rs. 30,000 then 10% tax is charged by IT department. If the salary is greater than Rs.70,000 and less than equal to Rs 2 Lakhs and expenses don't exceed Rs. 40,000 than 20% tax is charged. For salary greater than Rs 2 Lakhs, 5% additional surcharge is also charged. If expenses are greater than Rs. 40,000 surcharge is 9%. Design test cases for this system using decision table testing. Design the test cases based on the decision table.

4.

[14]

Explain the different approaches of incremental integration testing. Which one is the most preferred approach for large industrial software? How the stub and drivers are used in integration testing.

OR

What do you mean by regression testing? What are the main objectives of regression testing? With diagram explain the process of *Selective Retest Technique*.

5.

[7+7]

(a) Explain the software inspection process with its diagram.

(b) What is the need of debugging? Explain the process of debugging with a diagram.

OR

Write notes on:

[7+7]

(a) JMeter testing tool

(b) DevOps