Turbomachinery Institute of Technology and Sciences, Hyderabad-319
(Approved by AICTE. & Govt. of Andhra Pradesh, Affiliated to JNTU., Hyderabad)

Department of Computer Science & Engineering

Subject: Software Testing Methodologies **Branch: C.S.E.**

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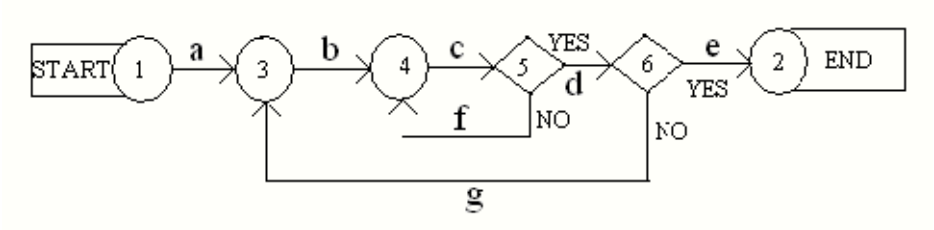
Question Bank

Unit 1: Introduction

1. (a) Why is it impossible for a tester to find all the bugs in a system? Why might it not be necessary for a program to be completely free of defects before it is delivered to its customers?
   (b) To what extent can testing be used to validate that the program is fit for its purpose? Discuss.
2. (a) What are the different types of Testing? Explain them briefly.
   (b) Differentiate between Function and structure.
3. (a) What is meant by integration testing? Discuss the goals of integration testing.
   (b) Explain clearly the white - box tests and behavioral tests.
4. (a) Why is it impossible for a tester to find all the bugs in a system? Why might it not be necessary for a program to be completely free of defects before it is delivered to its customers?
   (b) To what extent can testing be used to validate that the program is t for its purpose? Discuss.
5. State and explain various dichotomies in software testing.

Unit 2: Flow graphs and Path Testing:

1. Define Path Sensitization. Explain heuristic procedure for Sensitizing paths with help of an example.
2. Categorize different kinds of loops and explain.
3. (a) State and explain various kinds of predicate blindness with suitable examples.
   (b) What are link counters? Discuss their use in path testing.
4. (a) Consider the following flow graph Figure 2a



   Select optimal number of paths to achieve C1+C2 (statement coverage + branch coverage)

   (b) Explain the variable loops with an example.

Unit 3: Transaction Flow Testing

1. What is meant by data- flow anomalies? How data flow testing will explore them?
2. (a) Distinguish between control flow and transaction flow.
   (b) What is meant by Transaction flow testing? Discuss its significance.
3. Discuss in detail the data- flow testing strategies.
4. (a) Define a transaction. Give an example.
   (b) How does Transaction flows occur, illustrate with help of examples.
5. (a) State and explain various transaction flow junctions and mergers.
   (b) Explain the terms Inspections, Reviews and Walkthroughs.
6. (a) Discuss the three possible interpretations of the decision symbol with two or more out links.

(b) What is meant by transaction flow structure? Discuss the reasons why the transaction flows are often structured?

Unit 4: Domain Testing

1. (a) Discuss about Random Testing?
   (b) Explain about Linearizing Transformation?
2. Classify what can go wrong with boundaries, then de ne a test strategy for each case in domain testing.

3. (a) What is meant by a nice domain? Give an example for nice two-dimensional domains

   (b) Discuss the following terms:
   1. Linear domain boundaries
   2. Non linear domain boundaries
   3. Complete domain boundaries
   4. Incomplete domain boundaries

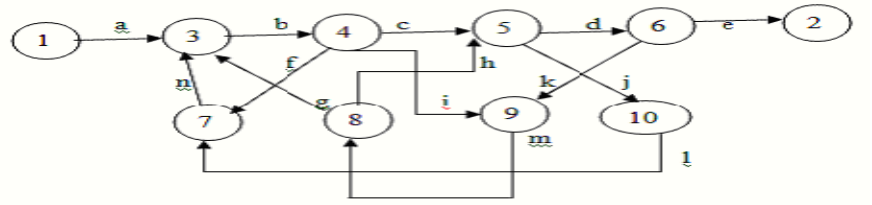
4. Discuss in detail the nice domains and ugly domains with suitable examples.
5. Explain the domain boundary bugs for two dimensional domains?

UNIT V

(a) Explain Flow-Anomaly Detection.

(b) (b) Explain Huang's Theorem with Example.

(c) Using reduction procedure convert flow graph whose links are labeled into a path expression. Explain each step with flow graph as shown in figure 5. [16]



3. Explain about Regular Expressions and Flow-Anomaly Detection.
4. Write the steps involved in Node Reduction Procedure. Illustrate all the steps with help of neat labeled diagrams
5. Write short notes on
   a. Path Products

b. Path Expressions

c. Path Sums

d. Loops

UNIT VI

1. (a) How can we form the specifications into the sentences? Write down the different phrases which can be used for the words.

   (b) Explain about the ambiguities and contradictions in the specifications

2. Reduce the following functions using Karnaugh Map method:

   F(A,B,C,D)= (4,5,6,7,8,12,13)+d(1,15)

3. (a) Whether the predicates are restricted to Binary Truth value or not? Explain?
   (b) Illustrate the applications of Decision Tables?
4. (a) How can we determine paths and domains in the logic-based testing?
   (b) How the Boolean expressions can be used in the test case design?
5. What is decision table and how does it is useful in testing. Explain it with help of an example.
6. (a) Reduce the following functions using Karnaugh Map method:

   F(A,B,C,D)= (1,2,3,8,9,10,11,14)+ d(7,15)

   (b) Demonstrate by means of truth tables the validity of the following theorems of Boolean algebra.

   i. Associative Laws
   ii. Demorgans theorems for three variables
   iii. Distributive laws of + over.

UNIT VII

1. Explain state testing and testability tips.
2. Explain State graphs with implementation.
3. (a) Mention design guidelines for building finite state machines into your code.
   (b) Write short notes on
   i. Switches, Flags, unachievable paths.
   ii. Essential an Inessential finite state behavior
4. The behavior of a finite-state machine is invariant under all encodings. Justify.
5. (a) Write Testers comments about state graphs.
   (b) What are the types of bugs that can cause state graphs?
6. (a) What are principles of state testing? Explain its advantages and disadvantages.
   (b) Write the design guide lines for building the finite state machine into code.

UNIT VIII

1. (a) Write about matrix powers and products.
   (b) Write about equivalence relation and partial ordering relation?
2. (a) How can a relation matrix be represented and what are the properties of relations?
   (b) Explain cross-term reduction and node-term reduction optimization.
3. (a) What are the matrix operations in tool building?
   (b) Discuss the algorithm for finding set of all paths.
4. (a) How can the graph be represented in matrix form?
   (b) Discuss Node reduction algorithm.

(c) How can node reduction optimization be done?

5. (a) Write a Partitioning Algorithm.
   (b) Write an algorithm for All Pairs Paths using Matrix Operations?
6. Write relative merits and demerits of different Graph Matrix representations.
7. What are graph matrices and their applications.