G.PULLAIAH COLLEGE OF ENGINEERING & TECHNOLOGY

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

NAME OF THE SUBJECT: SOFTWARE TESTING METHODOLOGIES

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YEAR/SEM: III B.Tech II SEM

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UNIT-5: STATES, STATE GRAPH AND TRANSITION TESTING, GRAPH MATRICES AND APPLICATION

2 MARKS QUESTIONS

1. What is meant by state, state graph and finite state machine?

State: A state can be defined as a combination of circumstances or attributes belonging for the time being to a person or thing.

State Graph: The state graph and its associated state table are useful models for describing the software behaviour.

Finite state machine: The finite state machine is a functional testing tool and testable design programming tool.

2. What is the main purpose of finite state machine (FSM) in state graphs?

- ➢ The finite state machine is a fundamental to software engineering as Boolean algebra.
- ➢ FSM can also be implemented as table driven software, in which case they are powerful design options.

3. What is meant by state table and what are the conventions used in a state table?

A state table is used to represent the state graph in tabular format that specifies the states, the inputs, the transitions and outputs.

The following are the conventions used in a state table or state transition table:-

- ➢ Each row in the table corresponds to a state.
- ➢ Each column in the table corresponds to an input condition.
- ➢ The box at the intersection of a row and a column specifies the next state(the transition) and the output if any.

4. What is the main objective of a state graph?

State graph is used to represent states, links and transitions from one state to involve a program that detects the character sequence "in the graph.

5. When can we say it is a good state graph?

➤ The total number of states is equal to the product of the possibilities of factors that make up the state.

➤ For every state and input there is exactly one transition specified to exactly one possibly the same, state.

➤ For every transition there is one output action specified.

➤ For every state there is a sequence of inputs that will drive the system back to the same state.

6. Define Equivalent states, Unreachable state, dead state?

Equivalent state: Two states are said to be equivalent if every sequence of inputs starting from one state produces exactly the same sequence of outputs when started from the other state.

Unreachable state: A state that no input sequence can reach

Dead State: A dead state is a state that once entered cannot be left.

7. What is meant by graph matrix?

A graph matrix is a square array with one row and one column for every node in the graph. Each row-column combination corresponds to a relation between the node corresponding to the row and the node corresponding to a column.

8. List the properties of relations in matrix?

Transitive relation, reflexive relation, symmetric relation anti symmetric relation.

9. When can we say it is a equivalence relation and partial ordering relation?

➤ An **equivalence relation** is relation if it satisfies the reflexive, transitive and symmetric properties.

➤ A **partial ordering relation** is a relation if it satisfies the reflexive, transitive and asymmetric properties

10. List the building tools of matrix representation?

➤ Node degree and graph density
➤ What's wrong with arrays/
   ➤ Space
   ➤ Weights
   ➤ Variable length Weights
   ➤ Processing time
➤ Linked list representation

11 What are the operations that can be performed on matrix?

➤ Parallel reduction
➤ Loop reduction

- Cross term reduction
- Addition, Multiplication and other operations
- Node reduction optimization