Assignment 6

This assignment is regarding the use of logic coverage criteria to test source code and specifications. Each question carries 1 mark.

1) The problem of reaching a particular statement containing a predicate with internal variables and assigning input values to control the internal variables in the predicate is called . . . . . . . . .

Accepted Answers:
(Type: String) Controllability.

2) State true or false: If a predicate has only one clause, predicate coverage is the same as clause coverage and combinatorial coverage.

- True
- False

Accepted Answers:
True

3) Which of the following represents the normal form in which predicates corresponding to pre-conditions occur?

- Prenex normal form
- Disjunctive normal form
- Conjunctive normal form
- None of the above

Accepted Answers:
Conjunctive normal form

4) State true or false: Clause coverage for predicates modelling specifications is always feasible.

- True
- False

Accepted Answers:

Accepted Answers:
False

Please refer the chart below for questions from 5 to 10:

For the following questions, we consider a Finite State Machine (FSM) given in the figure modelling the status of doors of a subway train. The FSM has four states indicating the following: all the doors are open/closed, left doors are open or, right doors are open. Transitions from one state to another indicate the platform being on left/right side and whether the train is moving or stationary etc.

5) For the FSM to be in the state corresponding to all the doors being open, the platform should 1 point be on left side and on right side.

- True
- False

Accepted Answers:
True

6) By inspecting the FSM, state true or false: It is possible to go from all the doors open state to all doors closed state when there is an emergency stop.

- True
- False

Accepted Answers:
False

7) Can the FSM model be in a state such that the train is not in station and not in a tunnel?

- Yes
- No

Accepted Answers:
Yes

Refer the above chart for the following questions:
Consider the guard: \( \text{trainSpeed}=0 \ \land \ \text{platform}=\text{left} \ \land \ (\text{location}=\text{inStation} \ \lor \ (\text{emergencyStop} \ \land \ \text{overrideOpen}) \land \text{location}=\text{inTunnel}) \). This predicate has six clauses. Answer the following questions with respect to this predicate.

8) State true or false: The conditions under which the clause \( \text{trainSpeed}=0 \) determines the guard is platform=left \ \land \ (\text{location}=\text{inStation} \ \lor \ (\text{emergencyStop} \ \land \ \text{overrideOpen}) \land \text{location}=\text{inTunnel}) \).
9) State true or false: The conditions under which the clause overrideOpen determines the guard. \( \text{trainSpeed} = 0 \lor \text{platform} = \text{left} \lor (\neg \text{location} = \text{inStation} \land \text{emergencyStop} \land \text{location} = \text{inTunnel}) \)

- True
- False

Accepted Answers:

\( \text{False} \)

10) State true or false: The conditions under which the clause platform=left determines the guard. \( \text{trainSpeed} = 0 \land (\text{location} = \text{inStation} \lor (\text{emergencyStop} \land \text{overrideOpen} \land \text{location} = \text{inTunnel})) \)

- True
- False

Accepted Answers:

\( \text{True} \)