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NPTEL

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Courses » VLSI Design Verification and test

Announcements **Course** Ask a Question Progress Mentor

Unit 9 - Syntax and semantics of CTL, Equivalences between CTL formulas and Introduction to Model Checking

Week 6--Assignment

The due date for submitting this assignment has passed. Due on 2016-09-05, 23:58 IST.

Submitted assignment

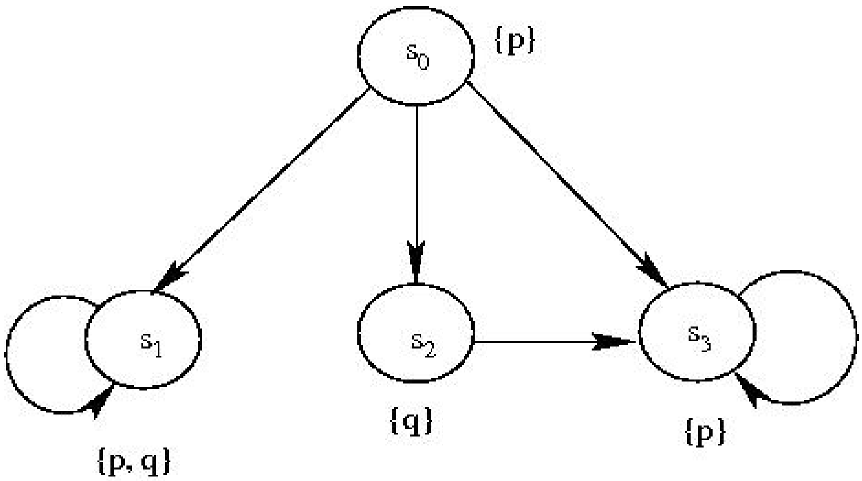
1) ________ is not a well formed CTL formula. Where p, q and r are atomic propositions. *1 point*

- EX(pVq)
- E[qU(pΛ r)]
- E[(qUp)Λ(qUr)]
- AGAXr

No, the answer is incorrect.
Score: 0

Accepted Answers:
E[(qUp)Λ(qUr)]

2) *1 point*



System M

Consider the system M shown in the figure. Which one of the followings is true?

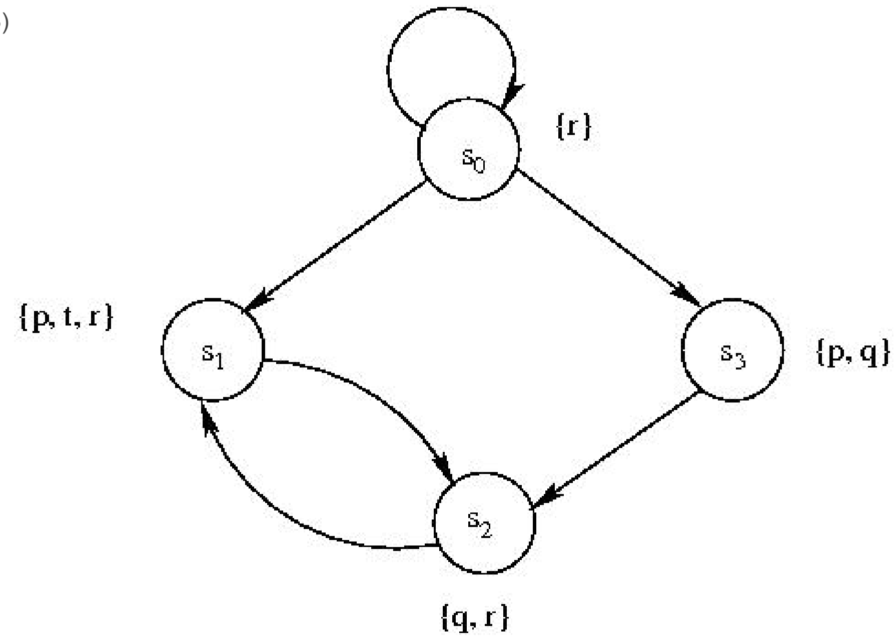
- M, $s_0 \models AG\ (q)$
- M, $s_2 \models EX\ (q \rightarrow p)$
- M, $s_0 \models AF\ (q)$

- M, s_3 ⊨ AG (p → q)

No, the answer is incorrect.
Score: 0

Accepted Answers:
M, s_2 ⊨ EX (q → p)

3) **1 point**



System M

Consider the system M shown in the figure. Which one of the following CTL formulas holds in state s_0?

- AG (p → r)
- AF (t)
- EG (r)
- E (t U q)

No, the answer is incorrect.
Score: 0

Accepted Answers:
EG (r)

4) Consider the system shown in question no. 3. Which of the followings are true? **0 points**

- M, s_2 ⊨ AG (r U p)
- M, s_3 ⊨ AF (t)
- M, s_2 ⊨ ¬ (AG (r))
- M, s_2 ⊨ E (t U q)

No, the answer is incorrect.
Score: 0

Accepted Answers:
M, s_2 ⊨ AG (r U p)
M, s_3 ⊨ AF (t)

5) Which one of the following pairs of CTL formulas are equivalent? Where ф is an atomic proposition. **1 point**

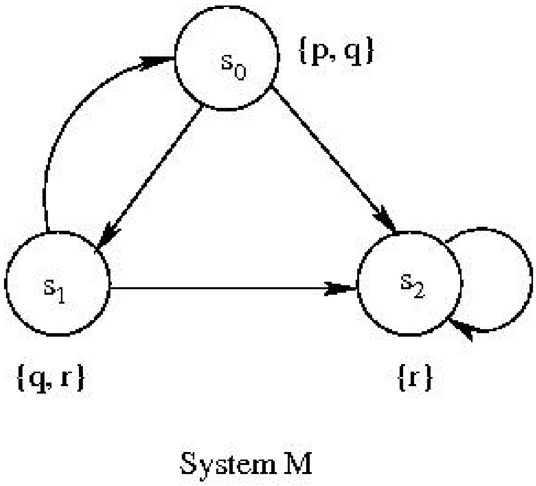
- AG(ф) and ф V AXAG(ф)
- ¬ (EF ф) and EG (ф)
- ¬(A X ф) and EG(¬ ф)

◯ ¬EG(¬ф) and AF(ф)

No, the answer is incorrect.
Score: 0

Accepted Answers:
¬EG(¬ф) and AF(ф)

6) **1 point**



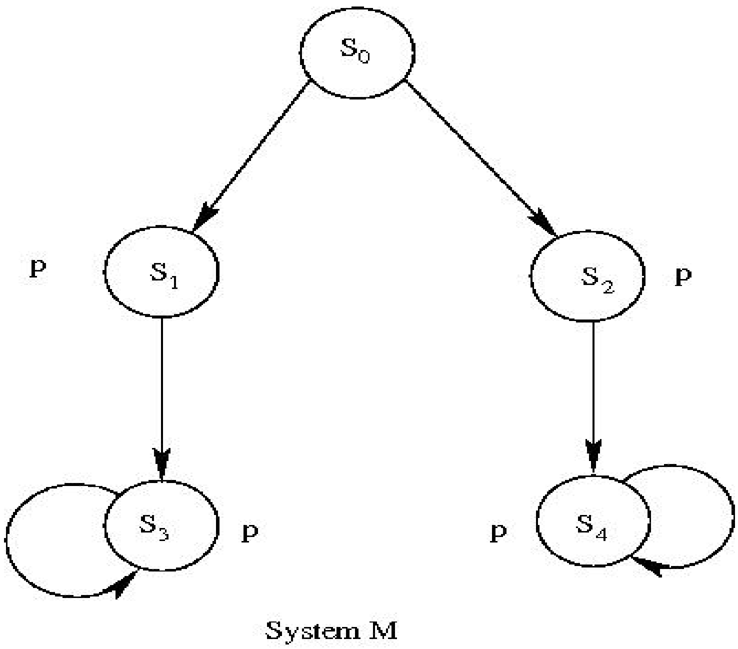
Consider the system M shown in the figure. Choose the correct one?

◯ M, s_0 ⊨ EF(p ∧ r)
◯ M, s_0 ⊨ E[(p ∧ q) U r]
◯ M, s_0 ⊨ AX (q ∧ r)
◯ All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
M, s_0 ⊨ E[(p ∧ q) U r]

7) **1 point**



Consider the system M shown in the figure. Choose the incorrect one.

◯ M, S_0 ⊨ AGp
◯ M, S_2 ⊨AGp
◯ M, S_0 ⊨AFp
◯ M, S_0 ⊨AXp

No, the answer is incorrect.
Score: 0

Accepted Answers:
$M, S_0 \vDash AGp$

8) Chose the correct one? Where p is an atomic proposition. *1 point*

- AF (p) ≡ E[T U p]
- AF (p) ≡ p V AXAF (p)
- EF (p) ≡ p V AXAF (p)
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
AF (p) ≡ p V AXAF (p)

9) Consider the mutual exclusion example with 3 processes, P_1, P_2 and P_3. The atomic propositions for P_i are n_i, t_i and c_i , where $1 \le i \le 3$. What is the CTL formula to represent Safety property? *1 point*

- AG $\neg((c_1 \wedge c_2) \vee c_3)$
- AG $\neg((c_1 \wedge c_3) \vee c_2)$
- AG $\neg (c_1 \wedge c_2 \wedge c_3)$
- AG $\neg ((c_2 \wedge c_3) \vee c_1)$

No, the answer is incorrect.
Score: 0

Accepted Answers:
AG $\neg (c_1 \wedge c_2 \wedge c_3)$

10) Consider the mutual exclusion example with 3 processes, P_1, P_2 and P_3. The atomic propositions for P_i are n_i, t_i and c_i , where $1 \le i \le 3$. What is the CTL formula to represent the specification “P_2 can always request to enter its critical section’’. *1 point*

- AG ($n_2 \rightarrow EXt_2$)
- AG ($n_1 \rightarrow EXt_2$)
- AG ($n_3 \rightarrow EXt_2$)
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
AG ($n_2 \rightarrow EXt_2$)

Previous Page | End