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CS433 Q 1: Which of the following are true about a theory T ?

- [ ] If T is axiomatizable, then T is enumerable.
- [ ] Due to Gödel's incompleteness theorem, natural numbers are not axiomatizable.
- [ ] Due to Gödel's incompleteness theorem, set theory is not axiomatizable.
- [ ] T is a set of formula that is closed under implication.

Answer

Note: please be careful before submitting the answer. You will not be able to change the answers.

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CS433 Q 1: Which of the following are true about a theory T ?

You have answered the following:

✘ If T is axiomatizable, then T is enumerable. (You are incorrect)
✘ Due to Gödel's incompleteness theorem, natural numbers are not axiomatizable. (You are incorrect)
✘ Due to Gödel's incompleteness theorem, set theory is not axiomatizable. (You are correct)
✔ T is a set of formula that is closed under implication. (You are correct)

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CS433 Q 2: Which of the following are axioms of Presburger arithmetic?

- [ ] $\forall z.\ (z + 1 = 0)$
- [ ] $\forall z \forall y.\ (z + (y + 1) = (z + y) + 1)$
- [ ] $0 + 0 = 0 \wedge (\forall z.\ (0 + z = z \Rightarrow (z + 1) + (z + 1) = (z + 1)) \Rightarrow \forall z.\ 0 + z = z)$ is an instantiation of induction schema
- [ ] $\forall x \forall y.\ (x + 1 = y + 1 \Rightarrow x = y)$

Answer

Note: please be careful before submitting the answer. You will not be able to change the answers.

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CS433 Q 2: Which of the following are axioms of Presburger arithmetic?

You have answered the following:

✘ ∀z. (z + 1 = 0) (You are correct)
✔ ∀z∀y. (z + (y + 1) = (z + y) + 1) (You are correct)
✘ 0 + 0 = 0 ∧ (∀z. (0 + z = z ⇒ (z + 1) + (z + 1) = (z + 1)) ⇒ ∀z. 0 + z = z) is an instantiation of induction schema (You are correct)
✔ ∀x∀y. (x + 1 = y + 1 ⇒ x = y) (You are correct)

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CS433 Q 3: Which of the following is true about Z3 python interface?

☐ x = BitVec('y') constructs a bit-vector variable y.
☐ z = And(a,b) constructs a formula that is disjunction of a and b.
☐ check() function of solver object checks satisfiability of added formulas to the solver.
☐ Var('x') constructs a variable x.

Answer

Note: please be careful before submitting the answer. You will not be able to change the answers.

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CS433 Q 3: Which of the following is true about Z3 python interface?

You have answered the following:

✘ x = BitVec('y') constructs a bit-vector variable y. (You are incorrect)
✘ z = And(a,b) constructs a formula that is disjunction of a and b. (You are correct)
✔ check() function of solver object checks satisfiability of added formulas to the solver. (You are correct)
✘ Var('x') constructs a variable x. (You are correct)

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CS433 Q 4: Which of the following is true about SMT2 file format?

- [ ] declare-fun creates a new function symbol
- [ ] All SMT solvers support the file format
- [ ] There is a database of satisfiability problems in SMT2 format
- [ ] pop removes formulas upto the last marker on the formula stack

Answer

Note: please be careful before submitting the answer. You will not be able to change the answers.

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CS433 Q 4: Which of the following is true about SMT2 file format?

You have answered the following:

✔ declare-fun creates a new function symbol (You are correct)
✘ All SMT solvers support the file format (You are incorrect)
✘ There is a database of satisfiability problems in SMT2 format (You are incorrect)
✘ pop removes formulas upto the last marker on the formula stack (You are incorrect)

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