LTP > ☑ Exámenes

Exámenes

Self-Assessment Test Theme 2

Parte 1 de 3 - Second   2.0/ 2.0 Puntos

Preguntas 1 de 10

1.0/ 1.0 Puntos. Puntos descontados por fallo: 0.33

The following BNF grammar defines the syntax of a programming language:

<Bool> ::= True | False

<Num> ::=0|1|2|3

<Inst> ::= skip | if <Bool> then <Num> else <Num> | Inst ; Inst

Which of the following expressions is legal (i.e., it can be generated using the previous grammar)?

- ◯ A. if True then 2 else 4;
- ◯ B. if True then 2
- ◯ C. if 1 then 2 else 4
- ◯ D. if True then 1 else 2

Preguntas 2 de 10

1.0/ 1.0 Puntos. Puntos descontados por fallo: 0.33

Which of the following statements is false?

- ◯

  A.
  A lexical analyzer (scanner) is a program that splits a string (the program) in a sequence of primitive syntactic components or tokens.
- ◯ B. The dynamic semantics of the language is checked during one of the compilation phases
- ◯ C. A parser is a program that recognizes a sequence of tokens and builds a sequence of instructions.
- ◯ D. A semantic analyzer is a program that checks the static semantics of language.

Parte 2 de 3 - First   2.67/ 3.5 Puntos

Preguntas 3 de 10

0.5/ 0.5 Puntos. Puntos descontados por fallo: 0.33

Two programs **P1** and **P2** are *equivalent* (**P1 ≈ P2**) if they have the same semantics. Considering the *big step* operational semantics as a basis to define such an equivalence, which of the following equivalence statements is **TRUE**?

- ◯ A. (x:= 5; while x>2 do x:= x-1) ≈ (x:= 1; x:= x+x)
- ◯ B. (P1 ≉ P2), siendo

> P1:   x := 0; y := 2;
>   if false then x:= y else y:= x;
>   x := y;
>
> P2:   x := 0; y := 2;
>   if false then x := y else {y := x; x := y};

- ◯ C. (x := 1; while x < 2 do x:= x + 3) ≈ (x := 1)
- ◯ D. (x:=1; y:=3; if x <= y then x:=0 else x:=1) ≈ (x:=1; y:=3)

Preguntas 4 de 10

0.5/ 0.5 Puntos. Puntos descontados por fallo: 0.33

Consider the following program *S*:

x := 0;
y := -1;
if x > 0 then y := 1 else x := 0;

and the specification given by the precondition P=*true* and postcondition Q = (y > 0). Which of the following claims is **TRUE**?

- ◯ A. No initial state satisfies the precondition P.
- ◯
  B.
  The program does **NOT** satisfy the specification, that is, there is an initial state that satisfies the precondition but the final state which is obtained after executing the program does not satisfy the postcondition.

- ◯ C. Starting from any initial state, the postcondition Q will always be true on the obtained final state.
- ◯ D. The final values of variables x and y depend on their values in the initial state.

Preguntas 5 de 10

0.5/ 0.5 Puntos. Puntos descontados por fallo: 0.33

Which is the most appropriate semantic style for program verification?

- ○ A. Small-step operational semantics.
- ○ B. Small-step operational semantics.
- ○ C. Axiomatic semantics.
- ○ D. Denotational semantics.

Preguntas 6 de 10

0.5/ 0.5 Puntos. Puntos descontados por fallo: 0.33

Which of the following statements concerning the semantics of programming languages is false?

- ○
  A.
  In the operational semantics the meaning of the instructions may be done in two ways: small-step and big-step.
- ○ B. The axiomatic semantics is used in some techniques for verifying imperative programs.
- ○
  C.
  The operational semantics is adequate to describe the meaning of all kinds of programming languages, including declarative ones.
- ○ D. The axiomatic semantics is a kind of operational semantics.

Preguntas 7 de 10

0.5/ 0.5 Puntos. Puntos descontados por fallo: 0.33

Given the transition rules for the *small step* operational semantics of the **while** command:

$$\frac{\langle b,\ e \rangle \Rightarrow false}{\langle while\ b\ do\ i,\ e \rangle \rightarrow \langle skip,\ e \rangle}$$

$$\frac{\langle b,\ e \rangle \Rightarrow true}{\langle while\ b\ do\ i,\ e \rangle \rightarrow \langle (i;\ while\ b\ do\ i),\ e \rangle}$$

which is the configuration that follows to $\langle while\ X{<}4\ do\ X{:=}X{+}1, \{X \mapsto 3\} \rangle$?

- ○ A. $\langle skip, \{X \mapsto 4\} \rangle$

- ○ B. $\langle skip, \{X \mapsto 3\} \rangle$

- ○ C. $\langle X{:=}X{+}1, while\ X{<}4\ do\ X{:=}X{+}1, \{X \mapsto 3\} \rangle$

- ○ D. $\langle X{:=}X{+}1, while\ X{<}4\ do\ X{:=}X{+}1, \{X \mapsto 4\} \rangle$

Preguntas 8 de 10

-0.33/ 0.5 Puntos. Puntos descontados por fallo: 0.33

Which is the function of the dynamic semantics?

- ○ A. Detect errors related to the syntax of the language.
- ○ B. Document the code.
- ○ C. The same as the static semantics but the dynamic semantics checks things during execution time.
- ○ D. Study the behaviour of the programs during execution.

Preguntas 9 de 10

0.5/ 0.5 Puntos. Puntos descontados por fallo: 0.33

If we say that "the meaning of a language instruction i is expressed in terms of the actions taken by an abstract machine to execute it", we are defining the:

- ○ A. axiomatic semantics
- ○ B. operational semantics
- ○ C. static semantics
- ○ D. none of the previous.

Parte 3 de 3 - Third   1.0/ 1.0 Puntos

Preguntas 10 de 10

1.0/ 1.0 Puntos. Puntos descontados por fallo: 0.33

Which is the main advantage of compilers with respect to interpreters?

- ○ A. The execution of compiled programs is faster than the execution of interpreted programs.
- ○ B. Program development and debugging is easier.
- ○ C. There is no advantage: interpreters do it better.
- ○ D. The generated code is more compact than the original program but slower than the interpreted program.

- PoliformaT
- UPV

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