**Test Id: 1** **(This test consists of 15 questions)**

**Note:** ***No document is allowed.***

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**Questions with one correct answers**

**Question 1.** Strings represented by $[0-9]+$ can be

- ☐ $\varepsilon, 10, 123. 579, 90$
- ☐ $[0, 10, 123, 579, 90]$
- ☐ $[0], [10], [123], [579], [90]$
- ☐ $0, 10, 123, 579, 90$

**Question 2.** The output of a Lexical Analyzer is

- ☐ A sequence of lexemes
- ☐ A sequence of tokens
- ☐ A parse tree
- ☐ A sequence of keywords

**Question 3.** Which of the strings is produced by the following grammar?

$S \longrightarrow expr$
$expr \longrightarrow expr + expr \mid expr * expr \mid (expr) \mid number$
$number \longrightarrow number\ digit \mid digit$
$digit \longrightarrow 0 \mid 1 \mid 2 \mid 3 \mid 4 \mid 5 \mid 6 \mid 7 \mid 8 \mid 9$

- ☐ $2 * 3 * 4 - 5$
- ☐ $00 + 1 * 2+$
- ☐ $0 + 01 * 2$
- ☐ $x := y + z$

**Question 4.** The bottom-up parsers can also be called

- ☐ Top-down parsers
- ☐ Recursive-descent parsers
- ☐ LL parsers
- ☐ Shift-reduce parsers

**Question 5.** In Prolog, suppose that the following clauses

$ancestor(X, Y) :- parent(X, Z), ancestor(Z, Y).$
$ancestor(amy, bob).$
$parent(eve, amy).$

have been entered into the database, then which of the following queries would cause the "yes" response?

- ☐ $?- ancestor(amy, eve).$
- ☐ $?- ancestor(eve, amy).$
- ☐ $?- ancestor(eve, bob).$
- ☐ $?- ancestor(bob, amy).$

**Question 6.** Which of the following Pascal programs causes a syntax error?

- ☐ var i: Integer; begin Writeln(i:=1); end.
- ☐ var i: Integer; begin Writeln; i:=1.0; end.
- ☐ var i: Integer; begin Writeln(i=1); end.
- ☐ var i: Integer; begin Writeln; i:=1; end.

**Question 7.** Which of the following parsers constructs parse trees from the root to the leaves?

- ☐ Bottom-up parsers
- ☐ Top-down parsers
- ☐ Shift-reduce parsers
- ☐ LR parsers

**Question 8.** Suppose that we have the following grammar

(1) $S \longrightarrow expr$
(2) $expr \longrightarrow expr + expr \mid expr * expr \mid (expr) \mid number$
(3) $number \longrightarrow number\ digit \mid digit$
(4) $digit \longrightarrow 0 \mid 1 \mid 2 \mid 3 \mid 4 \mid 5 \mid 6 \mid 7 \mid 8 \mid 9$

Then, the order of grammar rules applied by bottom-up parsers to construct the parse tree for the string "2+3*4" will be?

- ☐ 4 – 3 – 2 – 2 – 4 – 2 – 2 – 4 – 3 – 2 – 2 – 1
- ☐ 4 – 3 – 2 – 4 – 3 – 2 – 2 – 4 – 3 – 2 – 2 – 1
- ☐ 4 – 4 – 4 – 3 – 3 – 2 – 2 – 2 – 3 – 2 – 2 – 1
- ☐ 4 – 3 – 2 – 4 – 3 – 3 – 2 – 4 – 3 – 2 – 2 – 1

**Questions with multiple correct answers (Find all correct answers)**

**Question 9.** In TinyAda, which of the following statements are legal?

- ☐ integer: boolean;
- ☐ I = I + 1;
- ☐ type COLUMN_INDEX is range 1..10;
- ☐ while i <= 5 do J := J + 1; end loop;
- ☐ while i <= 5 loop J := J + 1; end while;
- ☐ while i <= 5 do J := J + 1; end while;

**Question 10.** In Java, which of the following statements are legal?

- ☐ System.out.println("Hello World");
- ☐ System.out.println(Hello World);
- ☐ int v: if (v == 0) v=v+1;
- ☐ System.out.println('Hello World');
- ☐ int v=0; if (v == 0) v=v+1;
- ☐ if (int v == 0) return v;

**Question 11.** In C#, which of the following statements are legal?

- ☐ if (int v == 0) return v;
- ☐ Console.out.println('Hello World');
- ☐ Console.WriteLine("Hello World");
- ☐ Console.out.println("Hello World");
- ☐ int v=0; if (v == 0) v=v+1;
- ☐ int v; if (v == 0) v=v+1;

**Question 12.** In Python, which of the following statements are legal?

- ☐ if (v == 0) v=v+1;
- ☐ sum := float(1) + float(2);
- ☐ Console.out.println("Hello World");
- ☐ print ("Hello World");
- ☐ println('Hello World');
- ☐ print ('Hello World');

**Fill-the-gap questions**

**Question 13.** Languages represented by regular expressions are called

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**Question 14.** Identify tokens in the following C declaration: const char *n_plain, *n_keytext;

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**Question 15.** Explain in detail the meaning of the following code in C++

```
enum Disc {IsInt,IsReal};
struct IntOrReal {
    enum Disc which:
    union {
        int i;
        double r;
    };
};
```

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