VIT

Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

School of Computer Science & Engineering

Continuous Assessment Test -II

CSE2002-Theory of Computation and Compiler Design

Time: 1:30 Hrs

Max.Marks:50

Answers ALL the questions

1. (a) Check whether the grammar is ambiguous or not   [5+4+1]

1.	S→0S1/SS/ ε	W= 0011
2.	S→AB/aaB , A→a/AA, B→b	W= aab
3.	S→SbS/a	W=ababab
4.	S→aSb/ab	W=aaabbb
5.	R→R+R/RR/R*/a/b/c	W=a+b*C

(b) E→E+T E→ T T→(E) T→ i   How many variables does the above grammar have when converted to CNF?

(c) The _____ running time of CYK is $O(n^3 \cdot |G|)$ where n is the length of the parse string and $|G|$ is the size of the context free grammar G

2. G: [3+4+5+3]

   S→X a↑

   X→Yb|YZc

   Y→d and Z→b

   For each of the the following grammar classes , if G is of that class, give the appropriate parsing table. If it is not of that class, Fully explain(Prove) why it is not, and also parsing the i/p ↑abbc↑ using option c).

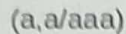   a) LL(0) b) LR(0) c) LR(1) d) SLR(1) e) LALR(1)

3. Consider the following grammar [4+4]

$$S \rightarrow (L) | a$$

$$L \rightarrow L, S | S$$

Construct the operator precedence parser and operator precedence functions. Then parse the following string: (a , a , a , a)

4 (a) Construct Pushdown automata for L = $\{a^n a^s d(ba)^s c^{2n} \in \{a, b, c, d\} * | n, s \geq 0\}$. Show that whether the PDA accepts the word **aaadbabacc** ? $\subset a^3 d$

(b) Find the language L(M) for the given PDA transition diagram. [5+3]

(a,a/aaa)
(a, Z/aaZ)   (b, a/epsilon)

(b, a/epsilon)   (epsilon, Z/Z)

q0 → q1 → qf

5. (a) Construct a TM that accepts all strings of Palindrome over the alphabet {a,b}. Given the input strings, **abba** and **ababa**, discuss the ID (instantaneous descriptions) of the TM. Explain the logic that how the Turing machine works and give the corresponding transition rules.

(b) Construct an unrestricted grammar (G: S→ACaB Ca→aaC CB→DB CB→E aD→Da AD→AC aE→Ea

AE→ ε) to accept $\{0^{2^i} | i \geq 1\}$ [5+4]

aabbaa