Complier Design

Duration: 40 Minutes **Maximum marks: 30**

Q.1 - Q.10 Carry One Mark each.

1. If G = {V, T, P, S} is a CFG, Then L(G) will be infinite if and only if: -
   (A) At least one production in P is recursive
   (B) All productions are recursive
   (C) No any production is recursive
   (D) None of the above

2. If G is a left Linear grammar then G is:-
   (A) A regular grammar
   (B) A context free grammar
   (C) A context sensitive grammar
   (D) All of the above

3. A grammer G contains a Production
   $A \rightarrow aBBd$
   Which of the following is true?
   (A) G can be LL(1)
   (B) G cannot be LL(1)
   (C) Unsufficient information
   (D) None

4. So called 90 – 10 rule for program execution states that
   (A) 10% of time is spent on 90% of the code.
   (B) 90% of time is spent on 10% of the code.
   (C) 90% of time is spent on 90% of the code.
   (D) 10% of time is spent on 10% of the code.

5. Which of the following is/are not contained in LEX source file
   (A) Auxiliary definitions having the format
   Name = regular expression
   (B) The translation rule having the format
   pattern {action}
   (C) Both
   (D) None

Q.6 - Q.10 Carry Two Mark each.

6. In a block structured language if procedure 'A' calls procedure 'B' having the nesting depths N_A and N_B respectively. Then which of the following is true?
   (A) $N_B - N_A \leq 1$
   (B) $N_B - N_A \geq 1$
   (C) $N_B - N_A < 1$
   (D) None of the above

7. Consider the following translation scheme:

$E \rightarrow E@\ T \quad (E.val = E_1.val + T.val)$

$E \rightarrow T \quad (E.val = T.val)$

$T \rightarrow T\%F \quad (T.val = T_1.val * F.val)$

$T \rightarrow F \quad (T.val = F.val)$

$F \rightarrow id \quad (F.val = number)$

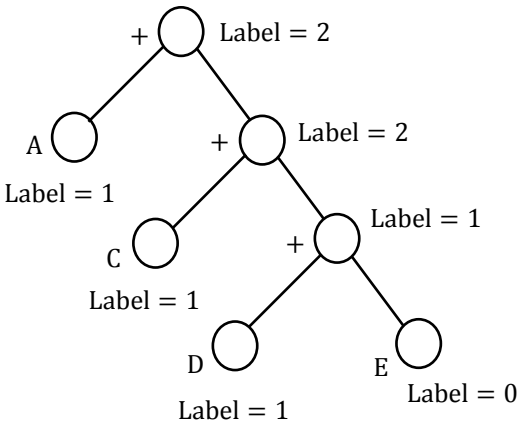
Calculate ratio of the value calculated by this translation scheme for string 6%3@5; and the value calculated by the scheme if '+' and '*' operators have been interchanged like: -

$E \rightarrow E@T \quad (E.val = E_1.val * T.val)$

$T \rightarrow T\%F \quad (T.val = T_1.val + F.val)$

In the given scheme?

8. Given a syntax tree with labeling of register requirement



After reduction of the register requirement, the number of register requirements is _____

9. Consider the following grammar: -

$S \rightarrow aA|bB$

$A \rightarrow aC|a|\epsilon$

$B \rightarrow bCD|\epsilon$

$C \rightarrow d|dS|\epsilon$

$D \rightarrow e|\epsilon$

How many non-terminals are there in the set of V in the above grammar for which Follow set will not contain terminals {e, $}

(A) 0 (C) 2

(B) 1 (D) 3

10. Consider the following grammer:

$S \rightarrow CC$

$C \rightarrow cC$

$C \rightarrow d$

Construct a transition diagram for above grammer's canonical sets and calculate the ratio of number of incoming edges to number of outgoing edges on node I_2. (nodes starting from I_0)