Theory of Computation (CSF351)

Test-3   17-11-2020; Time 30 Mins.   Max marks: 30   Wt:15%

Q1. Give CFG for $a^n b^m c^m d^n$ where $n \geq 0$ and $m \geq 1$.   [3M]

Q2. For the following CFG G, give set of transitions for look-ahead deterministic PDA.

   G={ S→ aBbA ;   B→ aA | e ;   A→Bb }

   Note: do not include unnecessary transitions. Include only useful/relevant transitions.   [10M]

Q3. Look at the following CFG G.

   G= { S→bDBC; D→ dD | EF ; B→ bC | Ca ; C→ Ea | Fa ; E→ m | e ; F→ n |e}

   ∑= { a, b, d, m, n}

   Give the FIRST set of non-terminals- D, B and C.   [6M]

Q4. Look at the following CFG G.

   G= { S→bDBC; D→ dD | EF ; B→ bC | Ca ; C→ Ea | Fa ; E→ m | e ; F→ n |e}

    ∑= { a, b, d, m, n}

   Give the FOLLOW set of each NT.   [6M]

Q5. For the below CFG G, give equivalent grammar after simplification.   [3M]

   G= { S→AB | CA; B→ BC | AB;   A→ a ; E→ ac ; C→ aB | b }

Q6. For the CFG G= { S→ aSb | SS | e } , which of the following are correct.   [2M]

         (i)   The G is unambiguous.
         (ii)   There exist $x, y \in L(G)$ such that $x.y \in L(G)$
         (iii)   Follow(S) is { b, $ }
         (iv)   The L(G) is not regular
      Note: Tick all correct options.