IV SEMESTER B.TECH. (COMPUTER ENGINEERING)

END SEMESTER EXAMINATIONS, MAY/JUNE 2017

SUBJECT: FORMAL LANGUAGES AND AUTOMATA THEORY

[CSE 2202]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitable assumed.

1A.	Design Deterministic Finite Automata for binary adder, dealing only with positive integers. Consider Carry and No Carry as two states.	2
1B.	Give dfa's for the language L = { w:n_a(w)mod>n_b(w)mod3}	4
1C.	Find the minimal DFA for the language L = { $a^n b^n$: n ≥0,n ≠ 4}	4
2A.	Write the left linear grammar for expression S→S10/S11/B/λ , B→B0/0	2
2B.	Test the following grammar is ambiguous or not S→AB/aaB, S →a/Aa,B→b If it is ambiguous construct an equivalent unambiguous grammar.	3
2C.	Find Dfa's that accepts: (i) L=(ab(a+ab)*(a+aa)) (ii) L = L(ab*a*) ∩ L((ab)*ba)	5
3A.	Remove all unit productions, useless productions and λ-productions from the given grammar.S→aA/aBB,A→aaA/λ,B→bB/bbC,C→B	3
3B.	Find the regular expression for L={$a^n b^n$,n≥4,m≤3}	3
3C.	Show that the given language L= {$a^n b^j$:n ≤ j^2 } on Σ ={a,b} is not context free.	4
4A.	Find an npda with no more than two internal states that accepts the language L(aa*ba*)	2
4B.	Construct an npda corresponding to the grammar,S→aABB /aAA, A→aBB/A,B→bBB/A.	4
4C.	Design a Turing Machine that copies strings of 1's such that L={ww : wϵ1*}.	4
5A.	What is recursive and recursively enumerable language? Show that the set of all languages that are not recursively enumerable is not countable.	3
5B.	Define multidimensional Turing Machine, With neat diagram. Then Show that such a machine can be simulated by a Standard Turing Machine.	3
5C.	Let G =({A,B,C},{a,b,c},S,P) with productions s→aABb/Bbb,Bb→C,AC→aac and take w=aaac .Then show how the derivation of w is paralleled by an Modified Post correspondence problem.	4