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CMR INSTITUTE OF TECHNOLOGY, BENGALURU.
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Internal Assessment Test 5 – January 2022

Sub:	Automata Theory and Computability				Sub Code:	18CS54	Branch:	ISE		
Date:	28/1/2022	Duration:	90 min's	Max Marks:	50	Sem/Sec:	V A, B&C		OBE	
	AnsweranyFIVE FULL Questions							MARKS	CO	RBT
1)	a) Discuss the difference between deterministic push down automata (DPDA) and non-deterministic push down automata (NPDA) with example.							[10]	CO3	L3
2)	Construct PDA from the given context free grammar (CFG). a) G = (V, T, P, S) where V = {S,A,B,C} (finite set of non-terminals), T = {a,b} (finite set of terminals), P = {S ->aABB, S ->aAA, A - >aBB, A -> a, B ->bBB, B -> A, C -> a} (finite set of production rules), S is the start symbol. b) Construct push down automata (PDA) for the following language. (Define all the tuples) L = {$a^{3n}b^{4n}$ | n >= 1}, ∑ = {a, b}.							[4 + 6=10]	CO3	L3
3)	a) Write down the formal definition of Turing machine. (Define all the tuples and show the language acceptance).							[10]	CO3	L3
4)	a) Construct Turing machine for the given language. L ={WCW^R | W € $(a+b)^*$} ∑ = {a,b, C}, C cannot be empty.							[10]	CO3	L3
5)	a) Discuss briefly Decidable and undecidable languages. b) What is the halting problem of Turing machine?							[5+5=10]	CO2	L2
6)	a) Prove that equivalence between multitap Turing machine and multitrack Turing machine.							10	CO3	L3

Faculty Signature   CCI Signature   HOD Signature