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End Sem(IV) — IT (CC - 8)

2022

Time: 3 hours

Full Marks: 60

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Answer from both the Groups as directed.

Group – A (Compulsory)

- 1. Answer the multiple choice questions:
 - (a) Which of the following does not represents the given language ? Language : { 0, 01 }
 - (i) 0+01
- (ii) {0} U {01}
- (iii) {0} U {0} {1}
- (iv) $\{0\} \land \{01\}$
- (b) Which of the following statement is false?
 - (i) Context free language is the subset of context sensitive language

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(Turn over)

	(11)	Regular language is the sub	set of							
*		context sensitive language								
	(iii)	Recursively enumerable language	e is the							
		super set of regular language								
	(iv)	Context sensitive language is a	subset							
		of context free language								
(c)	The	The ability for a system of instructions to								
	sim	ulate a Turing Machine is called.	-							
	(i)	Turing Completeness								
	(ii)	Simulation	*							
	(iii)	Turing Halting								
	(iv)	None of the mentioned								
(d) Push down automata accepts										
	lang	guages.	•							
	(i)	Type 3 (ii) Type 2								
	(iii)	Type 1 (iv) Type 0								
(e)	If L	1, L2 are regular and op(L1, L2) is also							
	regu	lar, then L1 and L2 are said to be	e							
	und	er an operation op.								
	(i) **	Open								
	(ii)	Closed								
- 112	2/2	(2)	Contd.							

(iii) Decidable
(iv) None of the mentioned
(f) If A and B are regular languages, ! (A' U B')
is:
(i) Regular
(ii) Non regular
(iii) May be regular
(iv) None of the mentioned
(g) Assume the R is a relation on a set A, aRb is partially ordered such that a and b are
•(i) Reflexive
(ii) Transitive
(iii) Symmetric
(iv) Reflexive and transitive
(h) The minimum number of states required to recognize an octal number divisible by 3 are/is:
'(i) 1 (ii) 3 (iii) 5 (iv) 7
(iii) 5 (iv) 7 (i) Relate the following statement:
Statement : All sufficiently long words in a regular language can have a middle section of words repeated a number of times to
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					. 4			
					hich	also	lies w	ithin
	413							
	. ,							
,								
					*			
(6)	• (iv)	None	of the r	mentior	ned			
De	efine p	umpin	g lemm	ıa.				5
			Grou	р – В		1		
An	wer a	ny thre	e of the	e follow	ving c	quest	tions :	
					J			45
W _I	nat do uivale	o you nce rel	mean ation.	by Re	elatio	on ?	Discu	ISS
What is qualifiers? Discuss Universal and Existential qualifiers.								
			t free	langua	ge ?	Exp	olain w	ith
(a)				1.70		sion	for t	ne
(b)			*	-		5 1		ite
(a)	Differ	ence b	etwee	n NFA	and I	DFA		
(b)	Expla	in klee	ne clos	sure an	d '+'	(plus) closu	re
	An Wi Exi (a) (b)	the (i) (ii) (iii) (iv) Define p Anwer and What is Equivale What is Existentia What is example. (a) Writh langual (b) Design down (a) Differ	the same (i) Turing (ii) Pump (iii) Arden • (iv) None Define pumping Anwer any three What do you Equivalence rel What is qualif Existential qualif Existential qualif What is context example. (a) Write the language of (b) Design a T. down the st (a) Difference be	the same langua (i) Turing Mach (ii) Pumping Len (iii) Arden's Then (iv) None of the recommend of the re	the same language: (i) Turing Machine (ii) Pumping Lemma (iii) Arden's Theorem • (iv) None of the mention Define pumping lemma. Group – B Anwer any three of the follow What do you mean by Re Equivalence relation. What is qualifiers? Discues Existential qualifiers. What is context free language example. (a) Write the regular explanguage of odd length stonguage of odd length sto	the same language: (i) Turing Machine (ii) Pumping Lemma (iii) Arden's Theorem • (iv) None of the mentioned Define pumping lemma. Group – B Anwer any three of the following of the the pumping lemma. What do you mean by Relation Equivalence relation. What is qualifiers? Discuss Lexistential qualifiers. What is context free language? example. (a) Write the regular express language of odd length string. (b) Design a T. M of the one's commodown the state transformation (a) Difference between NFA and its context and its context free language.	the same language: (i) Turing Machine (ii) Pumping Lemma (iii) Arden's Theorem • (iv) None of the mentioned Define pumping lemma. Group – B Anwer any three of the following quest What do you mean by Relation? Equivalence relation. What is qualifiers? Discuss Universistential qualifiers. What is context free language? Expexample. (a) Write the regular expression language of odd length string. (b) Design a T. M of the one's complimed down the state transformation diage (a) Difference between NFA and DFA	(ii) Pumping Lemma (iii) Arden's Theorem (iv) None of the mentioned Define pumping lemma. Group - B Anwer any three of the following questions: 15×3 = What do you mean by Relation? Discute Equivalence relation. What is qualifiers? Discuss Universal at Existential qualifiers. What is context free language? Explain we example. (a) Write the regular expression for the language of odd length string. (b) Design a T. M of the one's compliment. Write down the state transformation diagram? (a) Difference between NFA and DFA

5.

6.

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