University of Mumbai
Examination 2020

Program: BE Information Technology

Curriculum Scheme: Revised 2016

Examination: Second Year Semester IV

Course Code: ITC405 and Course Name: Automata Theory

Time: 40 minutes Max. Marks: 30

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Note to the students:- All the Questions are compulsory and carry equal marks .

Q1.	A R.E. for strings of even length over alphabet {a,b} is:
Option A:	(a.b)*
Option B:	(a/b)+
Option C:	(a/b).(a/b)+
Option D:	(a/b).(a/b)*
Q2.	R.E. for binary numbers divisible by 8 is:
Option A:	(0/1)+
Option B:	1.(1/0)*.00
Option C:	0+1.(0/1)*000
Option D:	0+1.(0/1)*0
Q3.	A Non deterministic finite automata is a ____ tupple
Option A:	2
Option B:	4
Option C:	5
Option D:	6
Q4.	Which of the following is not true
Option A:	Every R.E. has a corresponding F.A.
Option B:	DFA is a subset of NFA
Option C:	NFA is a subset of DFA
Option D:	FAs accept regular languages
Q5.	Kleen's Theorem states that:
Option A:	Any context free language can be accepted by a FA
Option B:	Any regular language can be accepted by a FA
Option C:	Any regular language can be accepted by a PDA
Option D:	Any regular language can be accepted by a TM
Q6.	Reducing a DFA results in:
Option A:	Approximation

Option B:	Optimization
Option C:	Possible incorrect performance
Option D:	Addition of null transitions
Q7.	Concept of stack is used in
Option A:	NFA
Option B:	DFA
Option C:	PDA
Option D:	TM
Q8.	Derivation trees for context free grammars can be:
Option A:	Optimal
Option B:	Approximate
Option C:	Ambiguous
Option D:	Unique to a string
Q9.	Automata theory is useful in
Option A:	Parsing
Option B:	Calculations
Option C:	Display output
Option D:	Read Input
Q10.	Halting problem is
Option A:	Solvable
Option B:	Unsolvable
Option C:	solved by PDA
Option D:	solves by TM
Q11.	With respect to capabilities which of the following is true?
Option A:	A TM can replace a FA and PDA
Option B:	A FA can replace a TM and PDA
Option C:	A PDA can replace a FA and TM
Option D:	A DFA can replace a NFA and PDA
Q12.	Which of the following is the best match
Option A:	Regular language and PDA
Option B:	Context free language and PDA
Option C:	Context free language and TM
Option D:	Regular language and TM
Q13.	A context free grammar corresponding to equal number of a’s and b’s is
Option A:	S-> aSb / ab
Option B:	S-> aSb / bSa / ab / ba
Option C:	S-> aSb / bSa / abS / baS / Sab / Sba / ∧
Option D:	S-> aSb , S-> ab

Q14.	A tape in a TM is concept of:
Option A:	Memory
Option B:	Stack
Option C:	Data bus
Option D:	Address bus
Q15.	A TM cannot be used as:
Option A:	Acceptor
Option B:	Generator
Option C:	Computer
Option D:	Transiter