ID NO.	

PRESIDENCY UNIVERSITY, BENGALURU

SCHOOL OF ENGINEERING

Weightage: 40% Max Marks: 80 Max Time: 2 hrs. 14 May 2018, Monday

ENDTERM FINAL EXAMINATION MAY 2018

Even Semester 2017-18 Course **: CSE 208 Theory of Computation** IV Sem. CSE

Instructions:

(i) Read the question properly and answer accordingly.

(ii) Question paper consists of 3 parts.

(iii) Scientific and Non-programmable calculators are permitted

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Part A

(4 Q x 6 M = 24 Marks)

1. Consider the transition table given below

∂	a	B
→ q_0	q1	-
q1	-	q2
*q2	q2	q2

   a. Draw transition diagram

   b. Identify two strings accepted by the automata.

   c. Identify two strings rejected by the automata

2. Construct the NFA with four states for L={ a^n : n ≥ 0} U { $b^n a$ n ≥ 1}

3. Design the context free grammar for the Language given below:

   L= { $0^n 1^n$ / n ≥ 0, m ≥ 0}

4. Define the following:

   a. DPDA b. ID of PDA c. L(M) of PDA

Part B

(4 Q x 9 M = 36 Marks)

5. State the Pumping Lemma for the Regular Language and prove that the language $L = \{ ww^R / w \in (a, b)^* \}$ is not regular.
6. Given the regular expression ab(a+b)*. Construct its equivalent € nfa.
7. Obtain a PDA to accept the following language by final state.
   $L= \{WcW^R \mid W \in (a,b)^*\}$. Draw the transition diagram for PDA .Also show the moves made by PDA for the string aacbb.
8. Convert the following CFG to GNF

   $S \rightarrow AA \mid 0$

   $A \rightarrow SS \mid 1$

Part C

(2 Q x 10 M = 20 Marks)

9. State the Pumping Lemma for Context free Language and prove that $L= \{ a^n b^n c^n / n>=0 \}$ is not context free.
10. Obtain a Turing machine to accept the language $L=\{ a^n b^n \mid n>=1 \}$

ID NO:	

PRESIDENCY UNIVERSITY, BENGALURU

SCHOOL OF ENGINEERING

Weightage: 20% Max Marks:40 Max Time: 1 hr. 2 April Monday 2018

TEST – 2 **SET A**

Even Semester 2017-18 Course: **CSE 208 Theory Of Computation** IV Sem. CSE

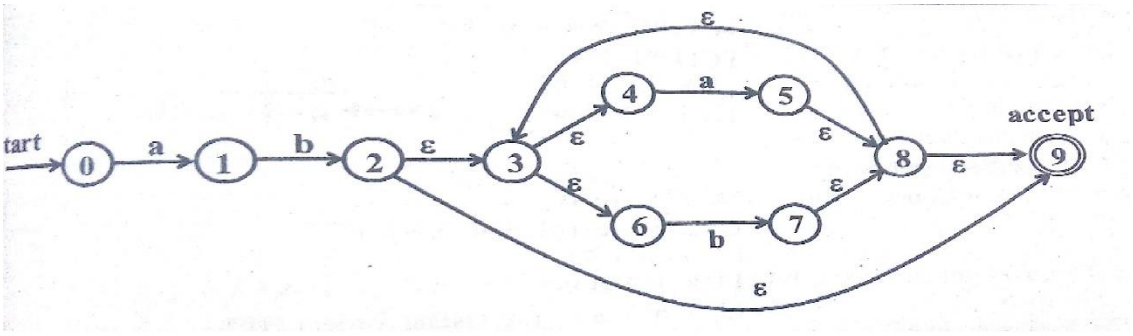
Instruction:

1) Read the question properly and answer accordingly.
2) Question paper consists of 3 parts.
3) Scientific and Non-programmable calculators are permitted

Part A

(4Q x 4 M = 16Marks)

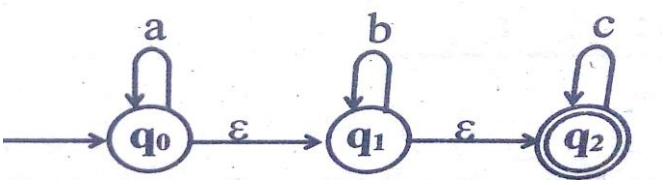
1. What is homomorphism? Explain with an example.
2. Obtain Regular expression for the language L={$a^{2n}b^{2m}$|n>=0,m>=0}
3. Define €/ג NFA?
4. Find €/ג closure of the states {2,3,8} in the €/ג NFA given below.



Part B

(2Q x 8M = 16 Marks)

5. Convert the following € NFA to its equivalent DFA.



6. State Pumping lemma, using pumping lemma prove that the language
   $L= \{a^{n!} \mid n>=0\}$ is not regular.

Part C

(1Q x 8 M = 8 Marks)

7. Minimize the below given DFA, using table filling method?

δ	0	1
→ A	B	E
B	C	F
*C	D	H
D	E	H
E	F	I
*F	G	B
G	H	B
H	I	C
*I	A	E

PRESIDENCY UNIVERSITY, BENGALURU

SCHOOL OF ENGINEERING

Weightage: 20 % Max Marks: 40 Max Time: 1 hr. 23 Feb Friday 2018

TEST – 1

Even Semester 2017-18 Course: **CSE 208 Theory of Computations** IV Sem. Computer Science

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Instruction:

(i) Read the question properly and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and Non-programmable calculators are permitted

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Part A

(4 Q x 4 M = 16 Marks)

1. a) Explain the components of Finite Automata

   b) Give the formal definition of NFA or NFA with λ

2. a) Define grammar using 4-tuple definition

   b) Consider the grammar **G=({S},{a,b},S,P),**with **P** is given by,

   S → aSb

   S → λ

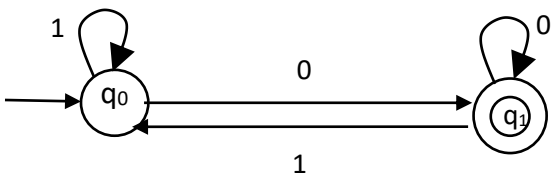
   Derive a string **aabb** using the above grammar.

3. Identify the five tuples of Finite Automaton using the given transition table

States	Inputs	
	a	b
→q_0	q_0	q_1
*q_1	q_0	q_1

4. Identify two strings in each case given below using the following Finite Automaton

   i) Accepted ii) Rejected



Part B

(2Q x 8 M = 16 Marks)

5. Prove that regular languages are closed under **Union** operation.
6. Construct a DFA that accepts all strings that contains **001** as substring over the alphabet ∑={**0,1**}

Part C

(1Q x 8 M = 8 Marks)

7. Convert the NFA defined by ,M=({q0,q1,q2,q3}, {a,b}, δ, q0, {q3)) and δ is defined by

$$\delta(q0,a)=\{q0,q1\}$$

$$\delta(q0,b)=\{q0\}$$

$$\delta(q1,b)=\{q2\}$$

$$\delta(q2,a)=\{q3\}$$

with initial state q0 and final state q3 into an equivalent DFA.