National University of Computer and Emerging Sciences, Lahore Campus

Course:	**Theory Of Automata**	**Course Code:**	**CS-3005**
Program:	**BS (Computer Science)**	**Semester:**	**Spring 4**
Duration:	**10 Minutes**	**Total Marks:**	**2+8**
Paper Date:		**Weight**	
Section:		**Page(s):**	
Exam:	**Quiz 1**	**Roll No.**	

Instruction/Notes: Use back side of this ass for rough work. Write down final answers only in the given space provided.

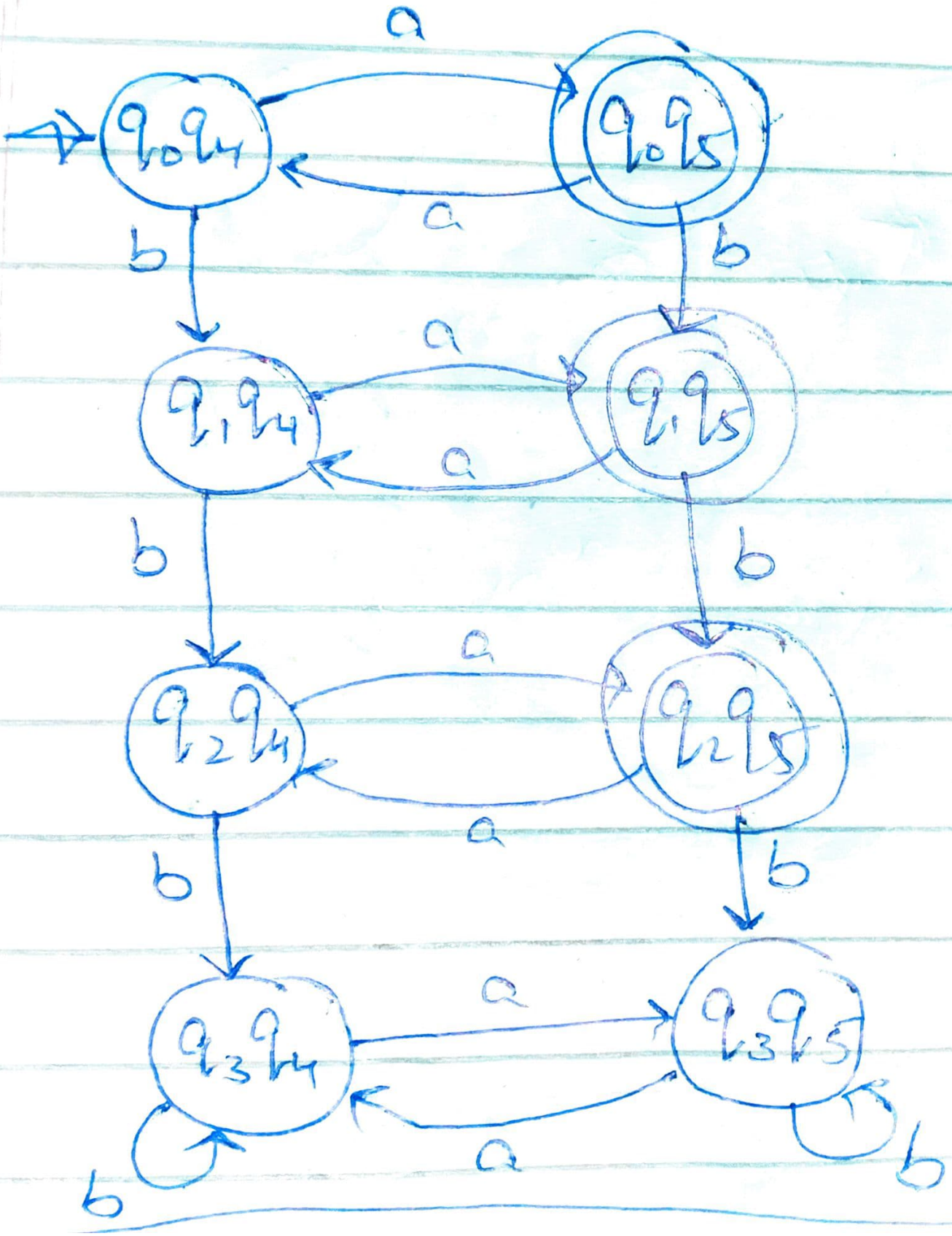
Q1a: Write 10 valid words for the Language given below in canonical order (increasing order of length)? [CLO 1]

L = {x | x ∈ {a,b}*; x contains at most 2 b's and odd number of a's}

Solution:

L = { }

Q1b: Construct a DFA for the given Language given in Q1a.


a
q_0q_4
q_0q_5
a
b
b
a
q_1q_4
q_1q_5
a
b
b
a
q_2q_4
q_2q_5
a
b
b
a
q_3q_4
q_3q_5
a
b
b

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Course:	**Theory Of Automata**	**Course Code:**	**CS-3005**
Program:	**BS (Computer Science)**	**Semester:**	**Spring 24**
Duration:	**10 Minutes**	**Total Marks:**	**8+2**
Paper Date:		**Weight**	
Section:		**Page(s):**	
Exam:	**Quiz 1**	**Roll No.**	

Instruction/Notes: Use back side of this ass for rough work. Write down final answers only in the given space provided.

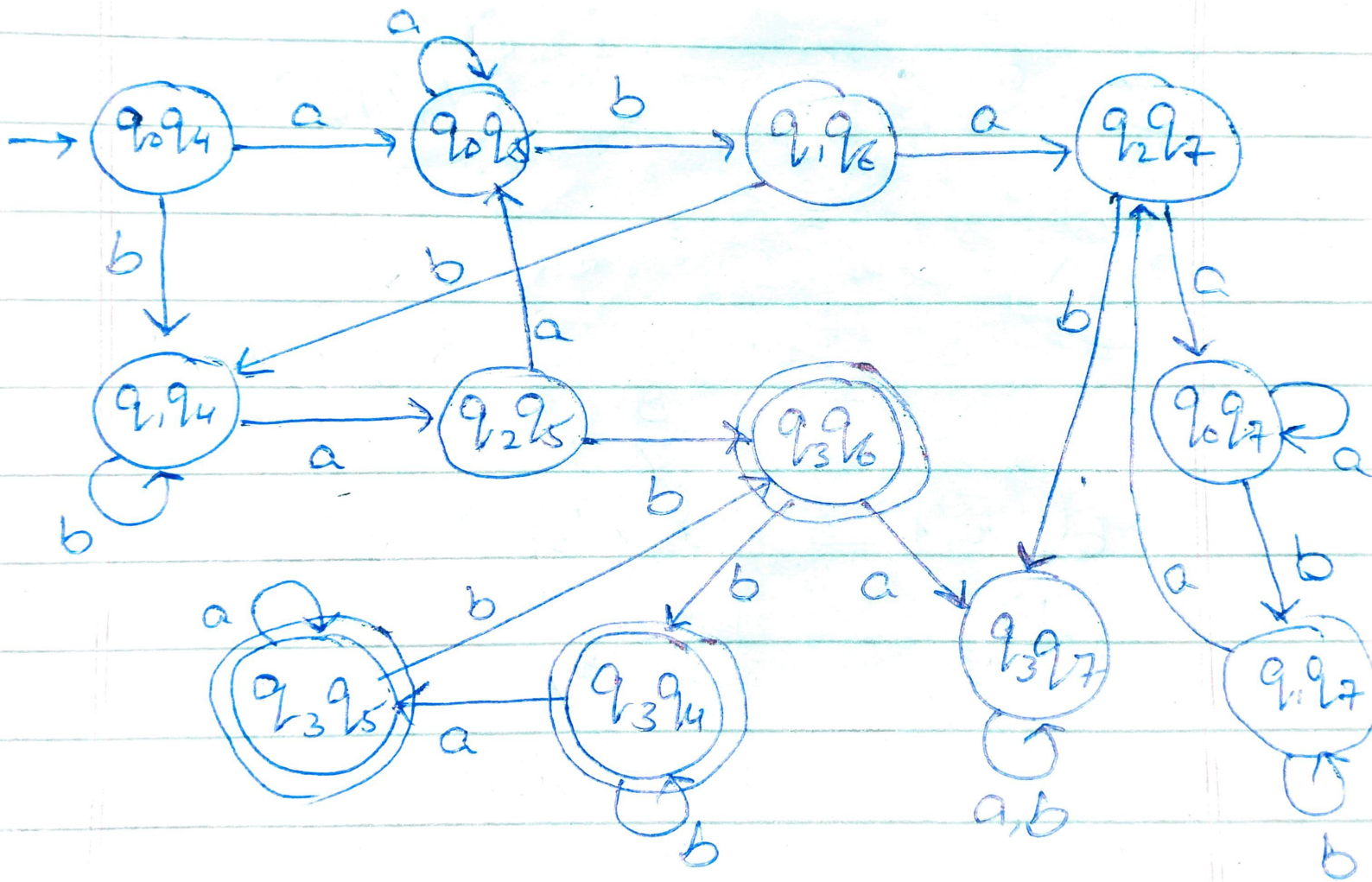
Q1a: Write 10 valid words for the Language given below in canonical order (increasing order of length)? [CLO1]

L= {x | x over {a, b} and x has the substring *bab* but does not have the substring *aba*}

Solution:

L = { **}**

Q1b: Construct a DFA for the given Language given in Q1a.


q_0q_4
q_0q_5
q_1q_6
q_2q_7
q_1q_4
q_2q_5
q_3q_6
q_0q_7
q_3q_5
q_3q_4
q_3q_7
q_1q_7
a
b
a,b

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Section:		Page(s):	
Exam:	Quiz 1	Roll No.	

Instruction/Notes: Use back side of this ass for rough work. Write down final answers only in the given space provided.

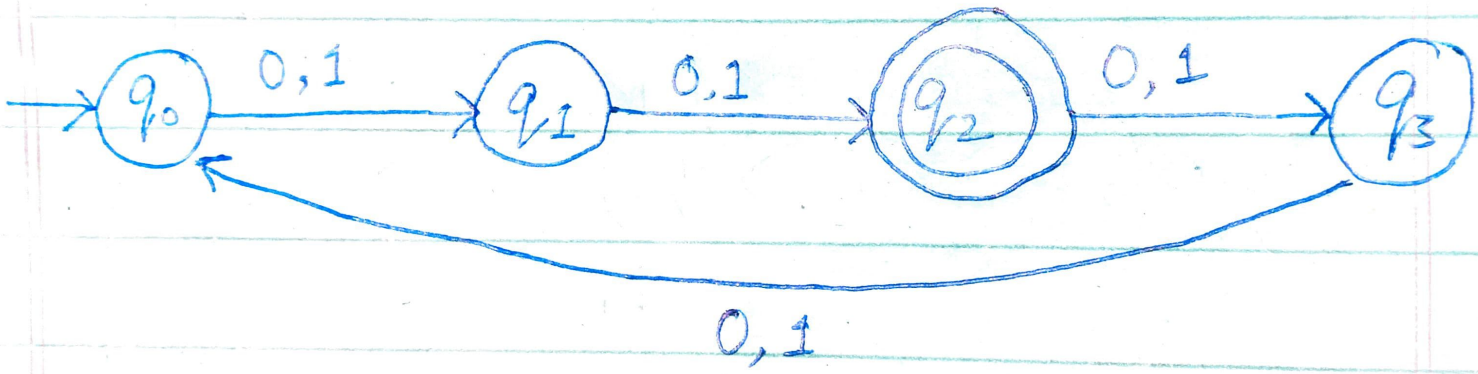
Q1a: Write 10 valid words for the Language given below in canonical order (increasing order of length)? [CLO1]

L= {x | x over {0, 1} and |x| is divisible by 2 but not divisible by 4}

Solution:

L = { }

Q1b: Construct a DFA for the given Language given in Q1a.


q_0
0, 1
q_1
0, 1
q_2
0, 1
q_3
0, 1

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Exam:	**Quiz 1**	**Roll No.**	

Instruction/Notes: Use back side of this ass for rough work. Write down final answers only in the given space provided.

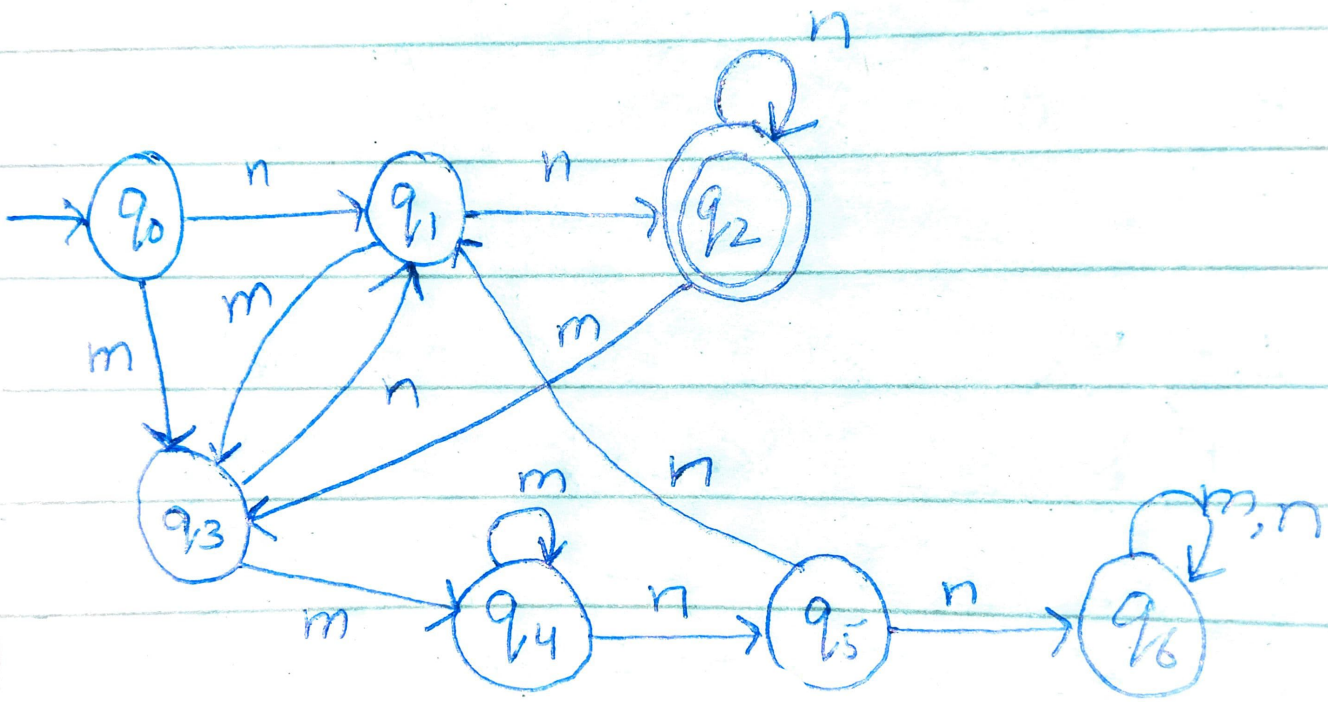
Q1a: Write 10 valid words for the Language given below in canonical order (increasing order of length)? [CLO 1]

$L = \{x \mid x \in (m, n)^*;$ x does not contains 'mmnn' as a substring and does ends on 'nn'$\}$

Solution:

L = { }

Q1b: Construct a DFA for the given Language given in Q1a.


n
n
n
m
m
m
n
m
n
m
m
n
m
n
n
m,n

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Instruction/Notes: Use back side of this ass for rough work. Write down final answers only in the given space provided.

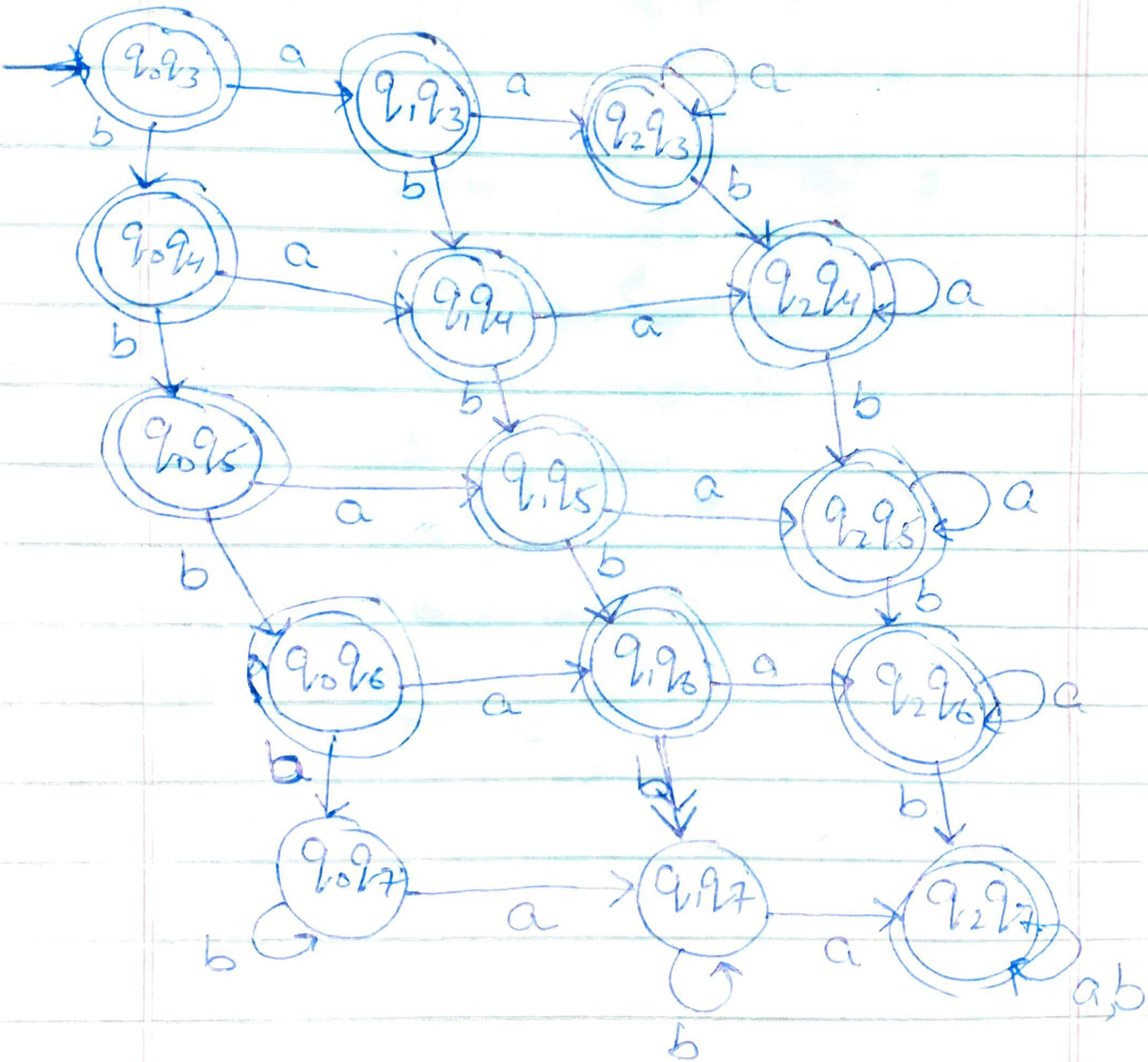
Q1a: Write 10 valid words for the Language given below in canonical order (increasing order of length)? [CLO 1]

L = {x over {a, b} and x contains at least 2 'a' or maximum of 3 'b' }

Solution:

L = { }

Q1b: Construct a DFA for the given Language given in Q1a.


q_0q_3
q_1q_3
q_2q_3
q_0q_4
q_1q_4
q_2q_4
q_0q_5
q_1q_5
q_2q_5
q_0q_6
q_1q_6
q_2q_6
q_0q_7
q_1q_7
q_2q_7
a
b
a,b

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Instruction/Notes: Use back side of this ass for rough work. Write down final answers only in the given space provided.

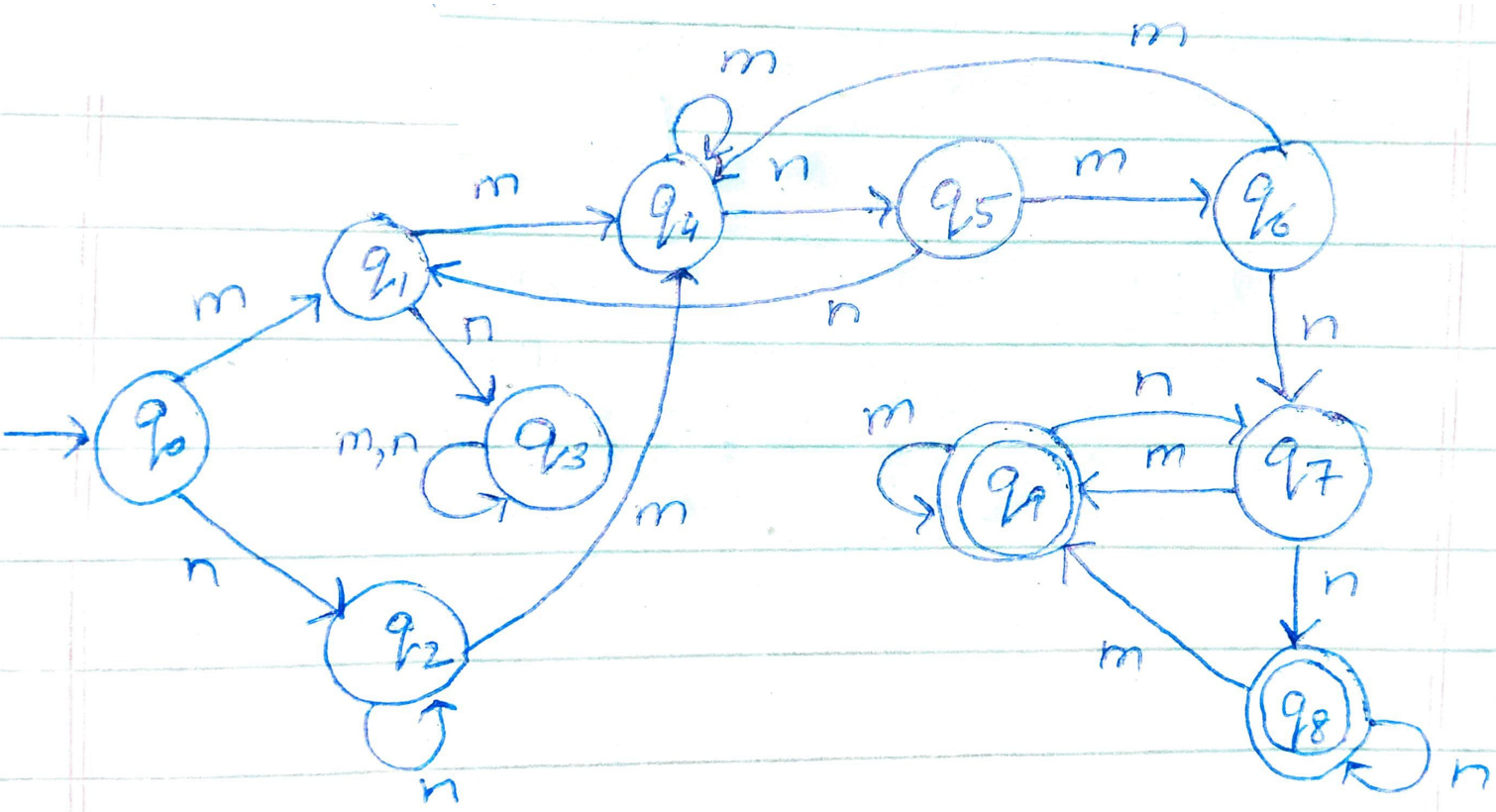
Q1a: Write 10 valid words for the Language given below in canonical order (increasing order of length)? [CLO 1]

L = {x | x ∈ (m, n)*; x contains 'mnmn' as a substring but does not ends on 'mn' and does not start with 'mn'}

Solution:

L = { }

Q1b: Construct a DFA for the given Language given in Q1a. You have to draw a state diagram? [CLO 2]


q0
q1
q2
q3
q4
q5
q6
q7
q8
q9
m
n
m,n

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Section:		**Page(s):**	
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Instruction/Notes: Use back side of this ass for rough work. Write down final answers only in the given space provided.

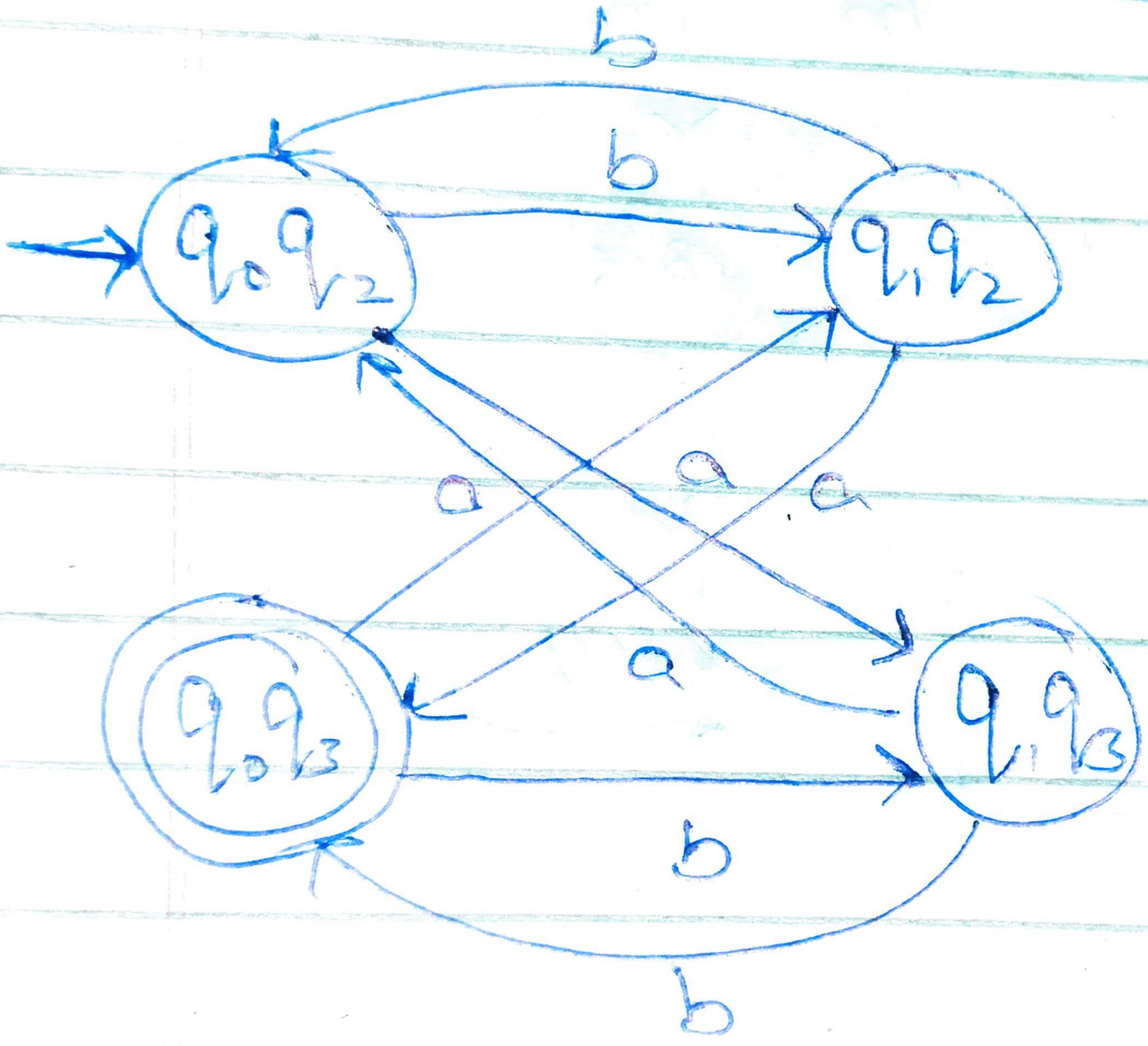
Q1a: Write 10 valid words for the Language given below in canonical order (increasing order of length)? [CLO 1]

L= {x | x over {a, b} and |x| is even and x contains odd number of 'a'}

Solution:

L = { }

Q1b: Construct a DFA for the given Language given in Q1a. You have to draw a state diagram? [CLO 2]


b
b
q_0q_2
q_1q_2
a
a
a
a
q_0q_3
q_1q_3
b
b