SET 1	CI44/CY44 – AUTOMATA THEORY AND COMPILER DESIGN MARKS: _____/10	USN:

1. Which of these is not true about Symbol Table

a) All the labels of the instructions are symbols

b) Table has entry for symbol name address value

c) Perform the processing of the assembler directives

d) Created during pass 1

Ans:

(1 M)

2. Obtain an NFA to accept strings of a's and b's ending with ab or ba and convert the obtained NFA to DFA by subset construction method. **(2 M)**

3. Lexical Analyzer uses the following patterns to recognize three tokens A, B, and C over the alphabet {a,b,c}. **A: a?(b|c)*a B: b?(a|c)*b C: c?(b|a)*c** Note that 'x?' means 0 or 1 occurrence of the symbol x. Note also that the analyzer outputs the token that matches the longest possible prefix. If the string *bbaacabc* is processes by the analyzer, which one of the following is the sequence of tokens it outputs? **(1 M)**

Steps:

Ans: _____

4. Choose the correct option for the following **(1 M)**

i. Consider the following C program:

```
int min (){ /*line 1*/
int I, N; /*line 2*/
fro (I=0, I /*line 3*/
}
```

While creating the object module, the compiler's response about line no. 3 is

(A) Only syntax error
(B) No compilation error
(C) Only lexical error
(D) Both lexical and syntax error

Ans:_____

5. How many tokens are there in the following C statement? **(1 M)**

printf ("j=%d, &j=%x", j,&j)

(A) 4 (B) 7 (C) 8 (D) 15 **Ans: _____**

6. Construct the transition diagram for keywords **(1 M)**

he, she, his, hers, he, me

7. Minimize the DFA given below. **(2 M)**

δ	a	b
→ q0	q1	q0
*q1	q1	q2
q2	q3	q2
*q3	q3	q4
q4	q5	q4
*q5	q5	q0

8. Construct DFA for the given NFA

	Next state	
	0	1
→ q0	q0,q1	q0
q1	q2	q1
q2	q3	q3
(q3)	-	q2

(2 M)

9. Construct a PDA to accept strings containing equal number of a's and b's. **(2 M)**

10. Write regular expressions corresponding to the following languages over Σ={0,1} **(1 M)**

i) Set of strings with two consecutive 0's

ii) Strings such that every pair of adjacent 0's appear before any pair of adjacent 1's.

SET 2	CI44/CY44 – AUTOMATA THEORY AND COMPILER DESIGN MARKS: _____/10	USN:

A compiler can check **(1 M)**

a) Logical error

b) Syntax error

c) Both logical error and syntax error

d) Not logical and syntax error

Ans:

2. Choose the correct option for the following **(1 M)**

i. Consider the following C program:

```
int min (){ /*line 1*/
int I, N; /*line 2*/
fro (I=0, I /*line 3*/
}
```

While creating the object module, the compiler's response about line no. 3 is

(A) Only syntax error
(B) No compilation error
(C) Only lexical error
(D) Both lexical and syntax error

3. How many tokens are there in the following C statement? **(1 M)**

if (a<b) printf("the value", m);

(A) 12 (B) 10 (C) 8 (D) 15

4. Construct the transition diagram for keywords **(1 M)**

is, was, wait, water, at

5. A lexical analyzer uses the following patterns to recognize three tokens T_1, T_2, and T_3 over the alphabet {a,b,c}. T_1: a?(b|c)*a T_2: b?(a|c)*b T_3: c?(b|a)*c Note that 'x?' means 0 or 1 occurrence of the symbol x. Note also that the analyzer outputs the token that matches the longest possible prefix. If the string *bbaacabc* is processes by the analyzer, which one of the following is the sequence of tokens it outputs? **(1 M)**

Steps:

Ans: _____

6. Design a NFA to accept strings over {0,1} containing either 101 or 110 as substring. Convert the same to a DFA. **(2 M)**

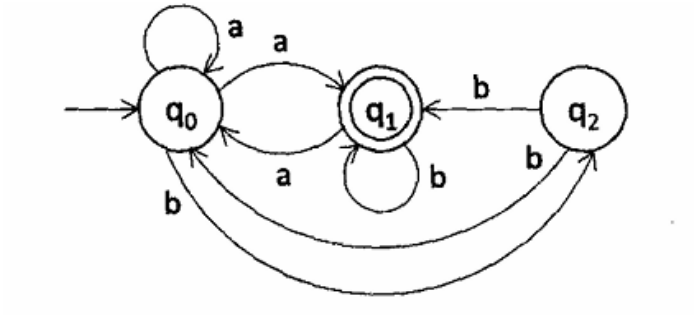
7. Give the regular expression for the following languages consisting of: **(1 M)**

i) Strings of a's and b's with alternate a's and b's

ii) Strings containing atmost one pair of consecutive a's

8. Design a PDA to accept the language $\{0^m1^n\,0^m \mid m,n>1\}$ **(2 M)**

9. Convert NFA to DFA **(2 M)**



10. Illustrate the analysis phase of the compiler by translating the assignment statement. Specify the values there in symbol table. **(2 M)**

Sum=Sum*B+C*Sum;

SET 3	CI44/CY44 – AUTOMATA THEORY AND COMPILER DESIGN MARKS: _____/10	USN:

1. **(1 M)**

Which of the following are Lexemes?

a) Identifiers

b) Constants

c) Keywords

d) All of the mentioned

Ans:

2. Minimize the DFA below. **(2 M)**

δ	0	1
→ q0	q1	q2
*q1	q3	q4
*q2	q5	q5
*q3	q3	q4
*q4	q5	q5
q5	q6	q5
q6	q6	q6

3. Choose the correct option for the following **(1 M)**

i. Consider the following C program:

```
int min (){ /*line 1*/
int I, N; /*line 2*/
fro (I=0, I /*line 3*/
}
```

While creating the object module, the compiler's response about line no. 3 is

(A) Only syntax error

(B) No compilation error

(C) Only lexical error

(D) Both lexical and syntax error

4. How many tokens are there in the following C statement? **(1 M)**

```
switch(inputvalue)
{
   case 1 : b =c*d; break;
   default : b =b++; break;
}
```

(A) 24 (B) 26 (C) 27 (D) 29

5. Construct the transition diagram for keywords **(1 M)**

he, she, his, hers, he, me

6. Give regular expressions for the following languages: **(1 M)**

(i) Strings of 0's and 1's with no consecutive 0's in it.

(ii) Strings of 0's and 1's ending with 001.

7. A lexical analyzer uses the following patterns to recognize three tokens T_1, T_2, and T_3 over the alphabet {a,b,c}. T_1: a?(b|c)*a T_2: b?(a|c)*b T_3: c?(b|a)*c Note that 'x?' means 0 or 1 occurrence of the symbol x. Note also that the analyzer outputs the token that matches the longest possible prefix. If the string *bbaacabc* is processes by the analyzer, which one of the following is the sequence of tokens it outputs? **(1 M)**

Steps:

Ans: _____

8. Convert the following NFA into an equivalent DFA. **(2 M)**

State	Δ		
	0	1	2
→q_0	{q_0,q_1,q_2}	{q_1,q_2}	{q_2}
q_1	Φ	{q_1,q_2}	{q_2}
* q_2	Φ	ϕ	{q_2}

9. Design a PDA to accept the language $\{0^m1^n\ 0^m \mid m,n>1\}$ **(2 M)**

10. Illustrate the analysis phase of the compiler by translating the assignment statement. Specify the values there in symbol table. **(2 M)**

Eqn=a*a+2*a*b+b*b;

SET 4	CI44/CY44 – AUTOMATA THEORY AND COMPILER DESIGN MARKS: _____/10	USN:

1. A regular expression represents

a) Part of a language

b) Cannot represent any language

c) Constituent strings of a language

d) None of the other options

Ans:

2.A lexical analyzer uses the following patterns to recognize three tokens T_1, T_2, and T_3 over the alphabet {a,b,c}. T_1: a?(b|c)*a T_2: b?(a|c)*b T_3: c?(b|a)*c Note that 'x?' means 0 or 1 occurrence of the symbol x. Note also that the analyzer outputs the token that matches the longest possible prefix. If the string *bbaacabc* is processes by the analyzer, which one of the following is the sequence of tokens it outputs? **(1 M)**

Steps:

Ans: _____

3. Choose the correct option for the following **(1 M)**

i. Consider the following C program:

```
int min (){ /*line 1*/
int I, N; /*line 2*/
fro (I=0, I /*line 3*/
}
```

While creating the object module, the compiler's response about line no. 3 is

(A) Only syntax error

(B) No compilation error

(C) Only lexical error

(D) Both lexical and syntax error

4. How many tokens will be generated by the scanner for the following statement?

x = x ∗ (a + b) – 5 **(1 M)**

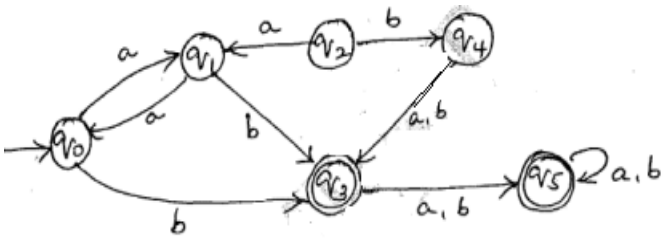
(A) 4 (B) 11 (C) 8 (D) 10

5. Construct the transition diagram for keywords **(1 M)**
he, she, his, hers, he, me

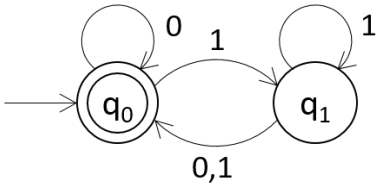
6. Give regular expressions for **(1 M)**

i. Strings starting with 0 and ending with 0.
ii. Strings with exactly one 1 more than one 0's

7. Minimize the following DFA. **(2 M)**



8. Convert the following NFA into its equivalent DFA using Subset Construction Method. **(2 M)**



9. Construct a PDA to accept strings containing equal number of a's and b's. **(2 M)**

10. Illustrate the analysis phase of the compiler by translating the assignment statement. Specify the values there in symbol table. **(2 M)**

Sum=Sum*B+C*Sum;