SET A

AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH
Faculty of Science and Technology
Department of Computer Science
CSC 3113: Theory of Computation (Section: All)

Mid Term Examination **Summer 2021-2022**

Total Marks: 100 **Moderator:** Sharfuddin Mahmood **Time:** 1.5 hours

General Instructions:

1. Answer all the questions in the question paper.
2. Return the question paper at the end of the examination.
3. Use pencil / pen to write the answer and to draw diagrams.
4. Marks on the right margin indicate full marks.

Name:	**ID:**
Section:	**Date:**
Acquired Marks:	**Proctor's Sign:**

1 Give the formal definition of NFA. 5x1=5

2 Write the **Regular Expression** of the following languages, where ∑= {m,n} (**ANY TWO**) 8x2=16

i. {w | each **m** in w is followed by at least three **n**}

Ans:

ii. {w | w has odd length and starts with **m**}

Ans:

iii. {w | w contains **'mnnmmn'** substring}

Ans:

3 Give the **Description** of the following Regular Expressions. Consider ∑ = {x,y} (**Any Two**) 6x2=12

i. (x∪y)* xyyxxy

Ans:

ii. x* y x* y x* y y*

Ans:

iii. (x U y). ((x U y). (x U y))*

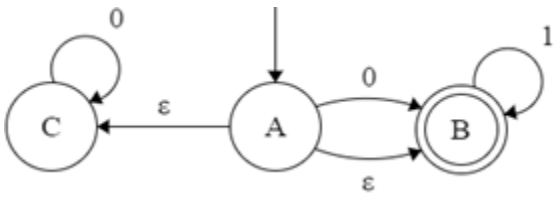
Ans:

4 With example describe **Sequence.** 2x1=2

5 Convert the following **Regular Expression** into equivalent **NFA** using formal procedure. 20x1=20

ab*a U a*b*a

6 Convert the following **NFA** into equivalent **DFA** using the formal procedure. 15x1=15



7 Design DFA for the following Language. Where $\sum$ = {a,b} and give the formal definition of your machine. (**Any-ONE**) 15x1=15

i. L= { w| w contains exactly two **a**'s and odd number of **b** }

ii. L= {w | ends with **'abbab'** substring}

Model#

8 Convert the following **DFA** into equivalent **Regular Expression** using Formal Procedure. 15x1=15