Answer the following questions [**4** questions in **1** pages]:
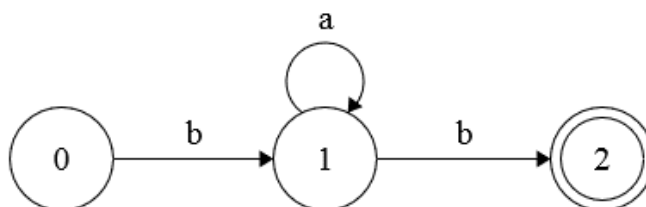
Question No. 1   [20 Marks]

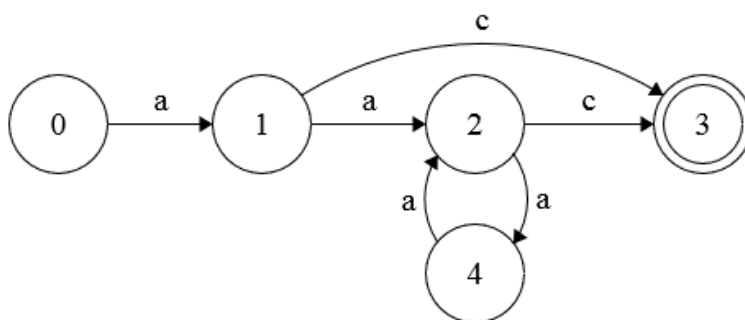**Construct a _finite automaton_ for each of the following languages:**

(a) L_1={bb, bab, baab, baaab, baaaab, …}

ba*b

(b) L_2={ ac, aac, aaaac, aaaaaac, aaaaaaaac, …}

ac + aa(aa)*c = a(c + a(aa)*c)

Question No. 2   [20 Marks]

Find a _regular expression_ for each of the following languages:

(a) L_3= {0, 1, 10, 11, 100, 101, 110, 111, …}

0 + 1 (0 + 1)*

(b) L_4= {w ∈ {a, b}* | w is string with an odd number of a's.}

b*ab*(b*ab*ab*)*   another one   b*a(b + ab*a)*

Benha University
1st Term (November 2018) Midterm Exam
Class: 3th Year Students (Computer Science Major)
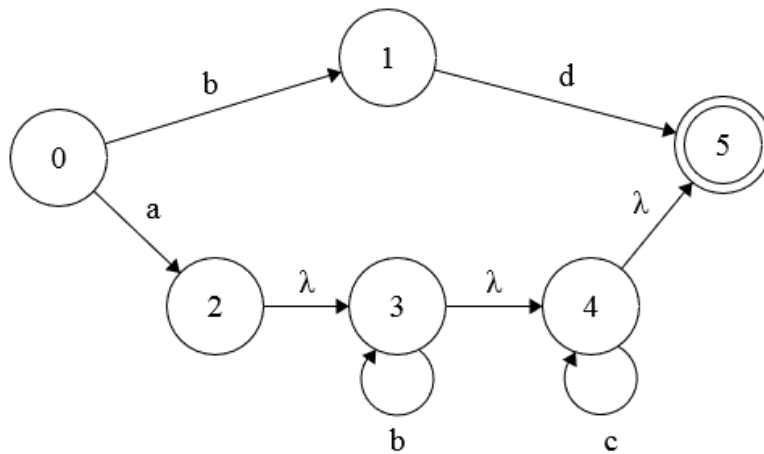**Subject:** Formal Languages & Automata
Course Code: CSC 341

Faculty of Computers & Informatics
Date: 10/11/2018
Time: 60 Minutes
Total Marks: 100 Marks
Examiner(s): Dr. Ahmed Hassan
Dr. Fathy Metwally

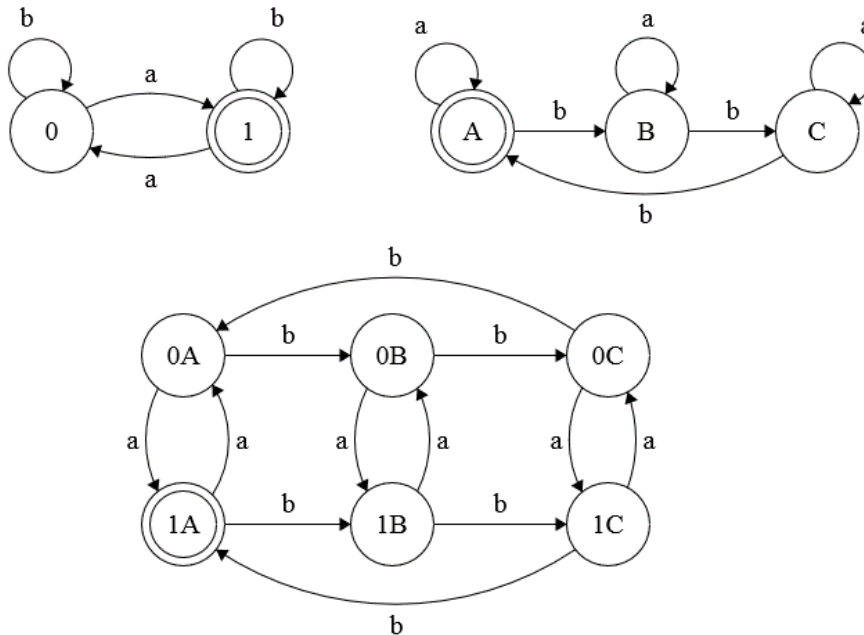## Question No. 3 [30 Marks]

Build an NFA for the following regular expression   ab*c* + bd

Question No. 4 [30 Marks]

Build a DFA for the language over {a, b} with an odd number of a's and the number of b's is divisible by three.

GOOD LUCK,