Faculty of Computers and Information Department: Computer Science 2nd, Semester Mid-Term Exam. Date: 17/11/2022	Menoufia University	Subject: Compiler Design Year: 2022/2023 Time allowed: 50 Minutes Full Mark: 20

Name:	Section:

Answer the following questions (Only one answer for each question)

Question 1 (10 marks):

1. What's the difference between Bootstrapping and Cross Compiling with an example for each one?

Bootstrapping	Cross Compiling

2. Show a one-state pushdown machine and recursive descent parser for the following grammar:

$$S \rightarrow aSbS \mid bSaS \mid \lambda$$

One-state Pushdown Machine	Recursive Descent Parser

3. Show the sequence of stacks for the pushdown machine you created above for this input string, **aababbba**.

Question 2 (10 marks):

1. Consider the following grammar:

$$S \rightarrow SAB \mid \lambda$$
$$A \rightarrow AaB \mid a$$
$$B \rightarrow AS \mid b$$

Is the grammar ambiguous or unambiguous? Justify your answer.

2. Show a finite state machine in table form and regular expressions for the language, where the alphabet is {0, 1}
   a) Strings containing an even number of **0** and ending with **0**.
   b) Strings containing **0100**.

a) **FSM**	b) **FSM**
RE	**RE**

3. Construct the finite state machine in graph form which specifies the same language as each of the following regular expressions. The alphabet is the binary digits {a, b, c}.
   a) c(a+b)*c
   b) (bb)*(aa)*cc

a)	b)

With my best wishes
Dr. Ibrahim A. Elgendy