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# Department of Computer Science and Engineering
# Midterm Examination Summer 2019
# CSE420: Compiler Design
# Total Marks: 20 Time Allowed: 1 Hour

- You **HAVE TO RETURN** this question paper and the answer script at the end of the exam. Your script will not be checked unless you do so.

**1.** What are the tasks of a ***preprocessor*** in a *language processing system*? Draw ***NFA based lexical analyzer*** for the following pattern and show the sequence of states entered when processing input **"xxbx"** $[2 + 4 = 6]$

a) xx b) xbbx* c) x* (b+) x d) b*xxb

**2.** Convert the *regular expression (m +n)* n* (m + n + ϵ)** directly to DFA over the alphabet, $\sum$ **= {m,n}** by computing ***firstpos, lastpos*** and ***followpos*** [10]

**3.** Given the following grammar, will a *recursive top down parser* be able to parse the input string ***"( a , a )"*** ? If not, modify the grammar to propose your solution to the problem. [2]

$$S \rightarrow ( L ) \mid a$$

$$L \rightarrow L , S \mid S$$

**4.** Show with an example, when *CFG* is used instead of *regular grammar* to describe a language. [2]