COL226: Programming Languages

Mon 14 Feb 2022   **MinorQ1**   5+15 (+5 for PwD) minutes   Max marks 10

Instructions:

1. Download the paper and write your name and entry number in the designated space on top and *do not forget to sign the honour statement below.*

2. Answer the question(s). *Answers will be judged for correctness, efficiency and elegance.*

4. If there are <u>minor mistakes</u> in the question, correct them <u>explicitly</u> and answer the question accordingly. If the question is <u>totally wrong</u>, give adequate reasons why it is wrong with detailed counter-examples, if necessary.

4. Scan the paper with your completed answer.

5. Upload it on Gradescope 2102-COL226 page within the given time. *Make sure the first page with your name, entry no and signature is also the first page of your uploaded file*

6. Late submissions (within 2 minutes of submission deadline) on the portal will attract a penalty of 10% of the total marks allotted to the paper for each minute of delay and 20% for each minute of delay thereafter.

7. Email submissions after the closing of the portal will not be evaluated (You get a 0).

8. Uploads without the first page details (including signature) may be awarded 0 marks.

I abide by the Honour code that I have signed on my admission to IIT Delhi. I have neither given any help to anybody nor received any help from anybody nor from any site or other sources in solving the question(s) in this paper.

Signature: _____   **Date:** _____

[5+5=10 marks]

Assume an alphabet $A = \{0, 1, .\}$ and a regular expression

$$(0|1)^*.(0|1)^+ \mid (0|1)^+.(0|1)^*$$

representing unsigned real numbers in binary.

1. Design a DFA to recognize the language of unsigned real numbers in binary.

2. Construct a right-linear grammar to generate the the language of unsigned real numbers in binary.