Instructions

1. Any submission after 10 pm will not be entertained.
2. Plagiarism will be checked very strictly. Any such practice will not be tolerated, and your marks for the component will be marked as 0.
3. Upload your solution in your own handwriting, scanned properly with your ID card in the front page.
4. ID card not necessary to be your University ID card.
5. Scanned document is required to be submitted in only PDF format that to not more than 5MB.
6. In case you file is large, compress it at   " https://pdfcompressor.com/ "

Q1. A marble is dropped at A or B. Levers X1, X2 and X3 direct the marble to fall either to the left or to the right. Whenever a marble encounters a lever, it causes the lever to reverse after the marble passes, so the next will take the opposite branch.
Model this toy by using finite state automata (Automata not required, just draw the transition table) and check the number of marble coming out of "C" for "ABBABBAABB" as the sequence of input:
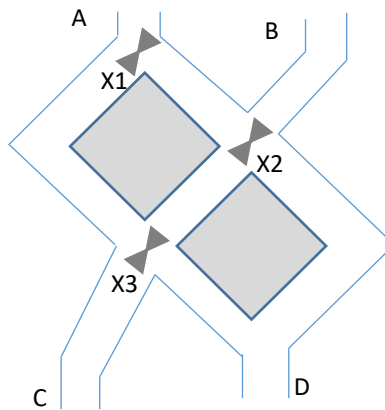
3 marks

Q2. Consider the grammar
$$E \rightarrow E + E \mid E - E \mid E * E \mid E / E \mid E \wedge E \mid - E \mid id$$

Produce the operator precedence relations for the above grammar and then parse the input "id + id * id ^ id – id / id" by using the operator- precedence relations.

Convert the operator precedence relation to corresponding Operator function Table.
Draw and explain every necessary steps.

3 marks

Q3 Consider the following production

$$E \rightarrow E - T \mid T$$

$$T \rightarrow F \wedge T \mid F$$

$$F \rightarrow (E) \mid id$$

Construct the LR(0) and SLR(1) Parsing table.

Parse "i ^ (i – i)" using the SLR(1) parsing table

2 marks

Q4. Explain the algorithms to find the First() and Follow() of a given grammar and then find the First() and Follow() of the following grammar.

$$E \rightarrow TE'$$
$$E' \rightarrow +TE' / \varepsilon$$
$$T \rightarrow FT'$$
$$T' \rightarrow *FT' / \varepsilon$$
$$F \rightarrow id/(E)$$

Draw the LL(1) parseing table for the above grammar **with proper justifications.**

2 marks