COURSE CODE: 10B11CI612   **MAX. MARKS: 25**

COURSE NAME: COMPILER DESGIN

COURSE CREDITS: 4   **MAX. TIME: 1.5 Hrs**

Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

Q.1   [CO 3] Answer the following statements with proper justifications: (2x3)
- a. Why LR parsing is more attractive as compared to LL parsing?
- b. If the grammar is ambiguous then there exist exactly one handle for each right sentential form.
- c. A grammar containing left recursion cannot be LL (1), therefore a grammar containing right recursion cannot be LR (1).

Q.2   [CO 4] Consider the following grammar: (2x3)

$$E \rightarrow E + T \mid T$$
$$T \rightarrow TF \mid F$$
$$F \rightarrow F* \mid a \mid b$$

- a. Construct the collection of LR (0) items for this grammar.
- b. Construct the SLR parsing table for this grammar.
- c. Show the moves of LR parser on the input string a*+a*.

Q.3   [CO 4] Consider the following grammar: (2x4)

$$S \rightarrow Aa \mid bAc \mid dc \mid bda$$
$$A \rightarrow d$$

- a. Construct the collection of LR (1) items for this grammar.
- b. Construct the parsing table using CLR (1) algorithm.
- c. Construct the parsing table using LALR (1) algorithm.
- d. Prove that the above grammar is LALR (1) but not SLR (1).

Q.4   [CO 5] a) Consider the following grammar. Prove that the given grammar is S-attributed or L-attribute. Design the syntax directed translation tree and also mention the attribute of the tree node.   (3+2)

$$DList \rightarrow D \mid DList;D$$
$$D \rightarrow T L$$
$$T \rightarrow int$$
$$T \rightarrow float$$
$$L \rightarrow ID$$
$$L \rightarrow L ,ID$$
$$ID \rightarrow identifier$$

b. Write the semantic rule and syntax directed translation tree for 3*5 the given grammar.

$$E \rightarrow T R$$
$$R \rightarrow \varepsilon$$
$$R \rightarrow + E$$
$$T \rightarrow F S$$
$$S \rightarrow \varepsilon$$
$$S \rightarrow * T$$
$$F \rightarrow n$$
$$F \rightarrow (E)$$