

SAMPLE PAPER

**B.Tech. Comp. Engg. VIth Sem Examination
Language Processor
Paper no CEN 607**

Time : Three hours

Max. Marks: 60

- Q1 a) Explain the Analysis Synthesis model of Compiler Design in details describing each of its Components. **6 Marks**
- Q1 b) Construct an NFA for the expression $a^*bb^*b[aa^*bb^*b]^*$. Also Convert the obtained NFA to the corresponding DFA showing all intermediate steps. **6 Marks**
- Q 2 a) Explain the various tasks of the Scanner phase in a compiler. Using a suitable pseudo code, explain how these tasks are performed and when. **6 Marks**
- Q2 b) Construct a Regular and a Context free grammar (*if both are possible*) for the following languages. **6 Marks**
i) A Language having all strings over (a, b) having equal no. of a's & b's.
ii) A Language $L1 = \{a^{2n} \mid n \geq 1\}$. Example sentences: aa, aaaa, aaaaaa etc.
Give Reasons for your answers.
- Q3 a) Explain the basic model of LL(1) parser. Also, describe the conditions for a grammar to be LL(1). **6 Marks**
- Q3 b) Construct an LALR(1) parser of the following CFG without simplifying it. **6 Marks**
 $X \rightarrow YZ \mid a \quad Y \rightarrow bW \mid \epsilon \quad W \rightarrow \epsilon$
- Q4 a) Differentiate between SDD and SDT using suitable examples for each along with their merits and demerits. **6 Marks**

OR

- Q4 a') Explain the following terms using suitable eg. **6 Marks**
i) Type Constructors
ii) Type System
- Also, explain using suitable e.g. how type checking is performed for various statements in a program.
- Q4 b) Write an SDD for the construction of syntax trees of declarative statements. Also construct an Annotated parse tree using this SDD for the declarative statement: **int id1, id2, id3;** **6 Marks**
- Q5 a) Define the followings terms using suitable examples: **6 Marks**
i) Leaders
ii) Natural Loops
iii) IN-OUT

- Q5 b) Explain how S-attributed definitions are evaluated. Describe the evaluation process of the expression **6 Marks**
 $(2 + (4 / 2)) * 5$ by using the SDD of arithmetic expression evaluation.
