BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS : MCA SEMESTER: IV
BRANCH : MCA SESSION :SP'2010
SUBJECT : COMPILER DESIGN

TIME : 2 HOURS FULL MARKS: 60

INSTRUCTION :

1. The question paper contains 7 questions each of 12 marks and total 84 marks.
2. Candidates may attempt any 5 question of 60 marks.
3. The missing data, if any may be assumed suitably.
4. *Before attempting the question paper, be sure that you have got a correct question paper.*

Q.1 (a) Explain the need of lexical analysis phase of compiler. [5]
(b) Explain a simple approach used for the design of lexical analysis. [7]

Q.2 (a) Explain the basic idea behind shift-reduce parsing. In shift-reduce parsing, right most derivation in reverse is followed. Explain the statement. [6]
(b) Discuss the drawbacks of shift-reduce parsing and how they can be rectified. [6]

Q.3 Consider the grammar: $A \rightarrow (A)A$ $A \rightarrow \epsilon$, where A is the start symbol and ϵ represents null string. Construct FIRST and FOLLOW sets for the non-terminal A and show that the grammar is LL(1). Also, explain the importance of FOLLOW set in predictive parsing. [12]

Q.4 (a) Why are LR parsers more attractive? [4]
(b) Explain the working of the driver program of a LR parser. Find LR(1) sets of items for the following grammar G. $A \rightarrow (A)$, $A \rightarrow a$, where A is the start symbol. Also, construct the parsing table. [8]

Q.5 (a) What is syntax directed translation? Write the syntax directed translation scheme for assignment statement with mixed mode operands. [6]
(b) Compare parse tree with syntax tree. Give the sequence of 3-address code for the expressions 2+3*b+c. [6]

Q.6 (a) Consider the following sequence of statements. A = b*c w = d+b. perform code generation using 2-registers and then using 1 register. [5]
(b) Explain the different sources of errors. Explain the error recovery of LR parsing process. [7]

Q.7 Write short notes on the followings: [6+6]
(a) Code optimization.
(b) Type checking.

*****30.4.2010*****E