

## FACULTY OF ENGINEERING AND TECHNOLOGY

BE(CSE) Examination - DEC - 2014

## PRINCIPLES OF COMPILER DESIGN(Revised)

[Time: THREE Hours]

[Max. Marks: 80]

"Please check whether you have got the right question paper."

- i) Question no.1&6 are compulsory.
- ii) Attempt any other two questions from each section
- iii) Assume suitable data, if necessary
- iv) Figures to the right indicate full marks.

## SECTION A

- Q1 a) With suitable diagram, explain the role of Lexical analyzer. Also discuss about Lexical analysis versus parsing. (05)
- b) Compare bottom-up and top-down parsing with suitable diagrams. (05)
- Q2 a) How to recognize tokens? Draw the transition diagram for relational operators and numbers (07)
- b) Consider the grammar: (08)
- $$E \rightarrow TE'$$
- $$E' \rightarrow +TE'/\epsilon$$
- $$T \rightarrow FT'$$
- $$T' \rightarrow *FT'/\epsilon$$
- $$F \rightarrow (E) \text{ lid.}$$
- Construct a predictive parsing table for the grammar given above. Verify whether the input string  $id + id * id$  is accepted by the grammar or not.
- Q3 a) Write and explain with suitable example, the algorithm for NFA to DFA conversion. (07)
- b) Explain canonical collection of LR (0) items with suitable example. (08)
- Q4 a) Discuss the structure of LEX programs. Write a LEX program to determine the tokens: letters, digits, white spaces & numbers. (07)
- b) Explain role of parser with suitable diagram. (08)
- Q5 a) With suitable diagram, explain various phases of compiler. (07)
- b) Explain LR parsing algorithm with suitable diagram. (08)

## SECTION-B

- Q6 a) Explain in detail about construction of syntax trees. (05)
- b) Explain the working of simple code generator. (05)
- Q7 a) Discuss in detail about inherited synthesized attributes. (07)
- b) Write short note on register allocation and assignment. (08)
- Q8 a) Explain in detail about type checking & type conversion. (07)
- b) What is peephole optimization? Discuss some example of program transformations that are characteristics of peephole optimization. (08)
- Q9 a) Explain in detail about bottom-up evaluation of s- attributed definitions. (07)
- b) Write short note on applications of DAG. (08)
- Q10 a) What is three-address code? Explain with suitable example. (07)
- b) Explain various principal sources of code optimization. (08)