

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular/Backlog), April-May 2015

B. Tech in Computer Science Engineering, Semester VI



Roll No.....

CSE603: COMPILER DESIGN

Time: 3 hours

Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

Q.1A Objective type multiple choice questions (10 questions @ 1 mark) 10

- i. The output of a lexical analyzer is
(a) Machine Code (b) Intermediate code (c) A streams of tokens (d) A parse tree
- ii. Symbol * represent in the regular expression:
(a) Only one character (b) One or more characters
(c) Zero or more characters (d) None
- iii. Which parser is allowed ambiguous grammar:
(a) LR(0) (b) Operator precedence parser (c) CLR(1) (d) All of these
- iv. Which parser has the maximum number of states:
(a) CLR(1) (b) LR(0) (c) SLR(1) (d) LALR(1)
- v. Parsing is also known as:
(a) Lexical analysis (b) Semantic analysis
(c) Code generation (d) Syntax analysis
- vi. $S \rightarrow xS \{ \text{print "1";} \}$
 $S \rightarrow y \{ \text{print "2";} \}$
 $S \rightarrow Sz \{ \text{print "3";} \}$
What is the translation of xxxxyzz using the syntax directed translation scheme described by the above rules?
(a) 23131 (b) 23311 (c) 11231 (d) 33211
- vii. $A \rightarrow BC \{ B.\text{count} = A.\text{count}; \}$
The above SDT is
(a) S-attributed (b) L-attributed (c) Both (d) None
- viii. Consider SLR(1) and LALR(1) table for a CFG which statement is false:
(a) Goto of both the tables may be different
(b) Shift entries are identical in both tables
(c) Reduce entries in tables may be different
(d) Error entries in tables may be different
- ix. Which parser is most powerful:
(a) LALR(1) (b) CLR(1) (c) CLR(1) (d) LR(0)
- x. What is the output of a yacc program
(a) y.tab.c (b) lex.yy.c (c) y.bat.c (d) none



- Q.2 Short answer type questions (4 questions @ 2.5 marks) 10
- i Define semantics.
 - ii Explain l-value and r-value of an expression
 - iii List various compiler construction tools.
 - iv Explain the roll of preprocessor in compilation process.
- Q.3A Explain lexical analysis with an example. 05
- Q.3B What is parser? Differentiate between top down parser and bottom up parser. 05
- Q.4A Explain semantic analysis with an example. 05
- Q.4B What is translator? Differentiate between different language translators. 05
- Q.5A What are the advantages and disadvantages of multipass compiler? 05
- Q.5B Explain the roll of symbol table used by compiler. 05
- Q.6A What do you mean by an ambiguous grammar? Prove that following grammar is ambiguous. 05
- $E \rightarrow E + E \mid E * E \mid id$
- Q.6B Differentiate between Fixed-size multi dimensional and Adjustable array. 05
- OR
- Q.6B Explain left recursive and right recursive grammar. Also convert the following left recursive grammar into right recursive grammar: 05
- $E \rightarrow (T) \mid id$
 $T \rightarrow T, E \mid E$
- Q.7A Explain the term Bootstrapping. Explain how it helps in constructing cross compiler. 05
- Q.7B Write a lex program to count no of positive and negative numbers form a text file. 05
- OR
- Q.7B Write short notes on heap allocation storage 05
- Q.8A Explain LL (1) parser. Find first and follow of the following grammar: 10
- $E \rightarrow TE'$
 $E' \rightarrow +TE' \mid \epsilon$
 $T \rightarrow FT'$
 $T' \rightarrow *FT' \mid \epsilon$
 $F \rightarrow id \mid (E)$
Also construct LL (1) parser table for the above grammar.

Q.9A Explain the various phases of compiler in detail. Also write the output for the following expression after each phase: 10

$a = b * c - d$

Q Find the SLR parsing table for the given grammar: 10

$E \rightarrow E + E \mid E * E \mid (E) \mid id$

Also parse the sentence $(a+b) * c$

OR

Q.9B Write Syntax Directed translation for generate three address code. Also explain it with a string $a = b * c + d$ 10

