

**Punjab Technical University**  
**Master of Computer Application Examination**

**MCA 3<sup>rd</sup> Semester COMPILER DESIGN 2006**

**Time Allowed : 3 Hours Maximum Marks:75**

**Note: (I) All questions from Part A are compulsory.**

**(ii) Attempt any nine questions from Part B. All questions carry equal marks.**

**Part A**

- (a) Which are the writing tools in compiler?
- (b) A compiler is described as a translator? Could any of its phases be described as interpreters? Which ones and why?
- (c) What is Bootstrapping in Compiler?
- (d) Differentiate local optimization and loop optimization.
- (e) What are regular set and regular expressions?
- (f) What are the duties of book keeping and error handler?
- (g) Write storage allocation strategies.
- (h) Write the regular expression notations?
- (i) What are the properties of regular set?
- (j) Write a grammar whose sentences are the regular expressions over the alphabet(a,b)
- (k) What are the dynamic storage allocation techniques?
- (l) What are the assignment statements?
- (m) Write the applications of DAG?
- (n) Write problems in code generation phase.
- (o) Justify loop optimization technique.

**Section B 5x9=45**

- 2. Draw and explain a parse tree for the following IF-Statement IF  $A > B$  &  $A \leq 2 * B - 5$  THEN  $A; +A = B$
- 3. Write about following: Parser generator , automatic code generator and syntax directed translation engine.
- 4. Determine and describe the large scale structure and intermediate code of a compiler in use in your computing environment. What section of compiler are optionally executed under user control?
- 5. Write about the following: Scanner generator, automatic code generator and data flow engine
- 6. Draw the flow chart of pass –I compiler.
- 7. Let R be some relation on a set A. Explain all the three properties of the relation.
- 8. Translate the arithmetic expression  $a * -(b+c)$  into
  - (a) A syntax tree (b) Postfix notation
  - (c) Three- address code
- 9. Construct a finite automata that will accept string of zeros and ones that contain even numbers of zeros and odd numbers of ones.
- 10. How we do minimization and optimization of a DFA.
- 11. Compare recursive – descent parsing and non recursive predictive parsing.
- 12. Write the algorithm for code- generation

13. Consider the grammar  $S \rightarrow (L) \mid aL \rightarrow L, S \mid S$

- (a) What are the terminals, non terminals and start symbol?
- (b) What language does this grammar generate?