

**B.TECH.****THEORY EXAMINATION (SEM-VI) 2016-17****COMPILER DESIGN****Time : 3 Hours****Max. Marks : 100****Note : Be precise in your answer. In case of numerical problem assume data wherever not provided.****SECTION – A****1. Attempt the following:****10 x 2 = 20**

- (a) State any two reasons as to why phases of compiler should be grouped.
- (b) Write regular expression to describe a language consist of strings made of even numbers a & b.
- (c) Write a CF grammar to represent palindrome.
- (d) Why are quadruples preferred over triples in an optimizing compiler?
- (e) Give syntax directed translation for case statement.
- (f) What is a syntax tree? Draw the syntax tree for the following statement:  $c \ b \ c \ b \ a \ - \ * \ + \ - \ * \ =$
- (g) How to perform register assignment for outer loops?
- (h) List out the criteria for code improving transformations.
- (i) Represent the following in flow graph  $i=1; \text{sum}=0; \text{while } (i \leq 10) \{ \text{sum} += i; i++ \}$
- (j) What is the use of algebraic identities in optimization of basic blocks?

**SECTION – B****2. Attempt any five of the following questions:****5 x 10 = 50**

- (a) Explain in detail the process of compilation. Illustrate the output of each phase of compilation of the input  $a=(b+c)*(b+c)*2$ .
- (b) Construct the minimized DFA for the regular expression  $(0+1)^*(0+1)10$ .
- (c) What is an ambiguous grammar? Is the following grammar ambiguous? Prove  $EE+|E(E)|id$ . The grammar should be moved to the next line ,centered.
- (d) Draw NFA for the regular expression  $ab^*/ab$ .
- (e) How names can be looked up in the symbol table? Discuss.
- (f) Write an algorithm to partition a sequence of three address statements into basic blocks.
- (g) Discuss in detail the process of optimization of basic blocks. Give an example
- (h) How to subdivide a run-time memory into code and data areas. Explain

**SECTION – C****Attempt any two of the following questions:****2 x 15 = 30****3** Consider the following grammar $S \rightarrow AS|b$  $A \rightarrow SA|a$ 

Construct the SLR parse table for the grammar. Show the actions of the parser for the input string "abab".

**4** How would you convert the following into intermediate code? Give a suitable example.  
i) Assignment Statements. ii) Case Statements**5** Define a directed acyclic graph. Construct a DAG and write the sequence of instructions for the expression  $a+a*(b-c)+(b-c)*d$ .