

Reg. No.

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**B.E. / B.TECH. DEGREE EXAMINATIONS, DEC 2019**

Sixth Semester

**IT16604 – AUTOMATA AND COMPILER DESIGN***(Information Technology)***(Regulation 2016)****Time: Three Hours****Maximum : 100 Marks**

Answer ALL questions

**PART A - (10 X 2 = 20 Marks)**

	CO	RBT
1. Define Finite State Systems.	1	R
2. Construct DFA for $(0+1)^* (0+1)^* 0^*$ ?	2	C
3. Eliminate the left factoring for the following Grammar : $S \rightarrow aSSbS / aSaSb / abb / b$	4	AP
4. Define Regular Expression.	2	R
5. What are the three kinds of Intermediate representation?	5	U
6. Write down SDD for a simple type declarations	3	R
7. How do we eliminate common sub expression. Give an example	5	AP
8. What is control flow analysis?	5	U
9. Write the characteristics of Peephole optimization?	3	U
10. What are the structure preserving transformations on basic blocks?	4	U

**PART B - (5 X 16 = 80 Marks)**

11. (a) Construct a minimized DFA for the given regular expression using (16) 1 C

Thomson Method  $(a)^*abb (b)^*(16)$ **(OR)**

- (b) Design a DFA to accept the following strings over the alphabet {0,1} (16) 1 C

a) The set of all strings beginning with 00

b) The set of all strings that begin with 1 and end with 0

c) Obtain the equivalent DFA using subset construction method for

 $011(0/1)^*$

12. (a) Construct a SLR parsing table for the following CFG (16) 2 C

$$E \rightarrow E + T \mid T$$

$T \rightarrow T^*F \mid F$

$F \rightarrow (E) \mid id$  and parse the input string  $id + id * id$

(OR)

- (b) Explain the various phases of a compiler in detail. Also write down the output for the following expression after each phase  $a := b * c - d$ . **(16)** **2** **C**

13. (a) How would you generate the intermediate code for the flow of control (16) 5 E statements? Explain with examples.

(OR)

- (b) Translate the arithmetic expression into  $a = b * c - b * c$  (16) 5 E  
 a)DAG b) Syntax Tree c)Quadruples d)Triples

14. (a) (i) Discuss about the run time storage management of a code generator. (8) 4 AN

- (ii) Explain the DAG representation of the basic block with (8) 4 AN example.

(OR)

- (b) Explain the principal sources of optimization. (16) 4 AN

15. (a) (i) List down & explain the issues in the design of code generator. (8) 3 AN  
(ii) Elaborate on how to compute program and instruction costs. (8) 3 AN

(OR)

- (b) (i) Brief about Machine Independent Optimization. (8) 3 AN  
(ii) Elaborate on peephole optimization. (8) 3 AN