PVP 14

Code: IT4T4

II B.Tech - II Semester – Regular / Supplementary Examinations October - 2020

AUTOMATA AND COMPILER DESIGN
(INFORMATION TECHNOLOGY)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks

11 x 2 = 22 M

1.

a) Define Deterministic Finite automata.

b) Differentiate between NFA and DFA.

c) Construct the regular expression for the language which consists of even number of a’s followed by odd number of b’s over set Z' {a,b}.

d) Define Parse Tree. Draw the Parsetree for “id+id*id” using E→E+E/E*E/id.

e) Construct a Context Free Grammar for language consisting of an a or b followed by any number of a’s or b’s over set Z' {a,b}.

f) Define syntax tree. Draw the syntax tree for the expression a*b+c.

g) Describe the different ways of generating intermediate code.

h) Define structural equivalence.

i) Differentiate between heap allocation and stack allocation.

j) Discuss the purpose of code optimization.

k) Construct the DAG for the expression a=(b+c)/d.

PART – B

Answer any ***THREE*** questions.   All questions carry equal marks.

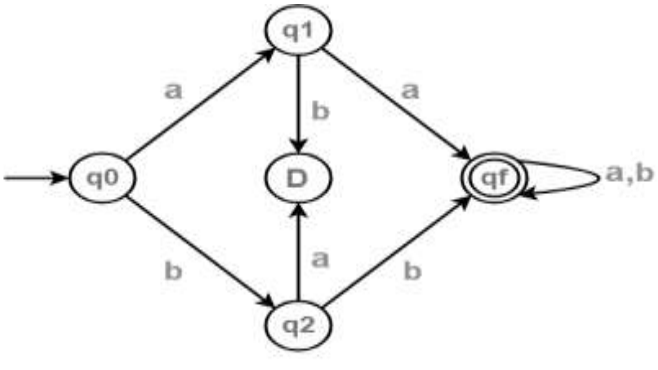
3 x 16 = 48 M

2. a) Construct a DFA equivalent to the NFA given below M={(q0,q1,q2), {a,b}, **δ** , q0, { q2}} where **δ** is defined by the following transition table. 8 M

δ	0	1
q0	(q0,q1,q2)	q2
q1	q2	q1
q2	null	(q0,q1)

b) Explain in detail lexical and syntax analysis phase of a compiler. 8 M

3. a) Construct a CFG for the given automata. 6 M



DFA

b) Consider the following grammar. 10 M

E->E+T/T

T->T*F/F

F->(E)/id Construct the SLR parsing table. Find LR(0) items.

4. a) Write the quadruple, triple and indirect triple for the following statement x=(c*d)+(a*-b) and justify your answer. 8 M

b) Explain syntax directed definition, inherited attributes with an example. 8 M

5. a) Discuss different kinds of type checking of expressions and statements with suitable examples. 8 M

b) Illustrate different storage allocation strategies with suitable examples. 8 M

6. a) Explain optimization of basic blocks with its rules and examples. 8 M

b) Explain code generation algorithm with an example.

8 M