Printed Pages – 6 Roll No. : .....

# C033612(033)

## B. Tech. (Sixth Semester) Examination, April-May 2022

AICTE (~~New Branch~~) Scheme

**(Information & Technology Branch)**

**COMPILER DESIGN**

**(BT3033)**

***Time Allowed : Three hours***

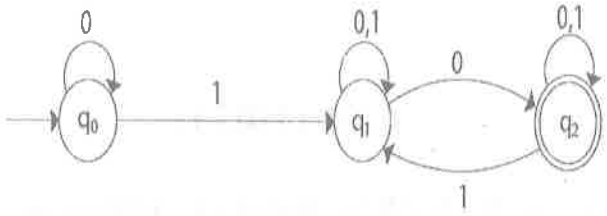
***Maximum Marks : 100***

***Minimum Pass Marks : 35***

***Note :*** *Part (a) is compulsory from each unit. Attempt any* ***two*** *parts from (b), (c) and (d). All questions carry equal marks.*

### Unit-I

**1.** (a) What is the need for separating lexical analysis and syntax analysis? 4




(b) Convert the given NFA to DFA. 8

(c) Construct deterministic Finite Automata to accept the regular expression :

$$(0+1)^*(00+11)(0+1)^*$$ 8

(d) Summarize in detail how the tokens are specified by the compiler with suitable example. 8

**Unit-II**

**2.** (a) What are the problems associated with Top Down Parsing? 4

(b) Consider the grammar :

$$E \rightarrow TE'$$

$$E' \rightarrow +TE' \mid \varepsilon$$

$$T' \rightarrow FT'$$





$$T' \rightarrow FT' \mid \varepsilon$$

$$F \rightarrow (E) \mid id$$

Construct a predictive parsing table for the following grammar and also check whether string $id + id^* id$ is accepted or not. 8

(c) Construct the SLR parser table for the following grammar :

$$E->E+T/T$$

$$T->T*F/F$$

$$F->(E)/id$$ 8

(d) Write the comparison among SLR Parser, LALR parser and canonical LR Parser. 8

**Unit-III**

**3.** (a) Give the S-attributed SDD of a simple desk calculator and show annotated parse tree for the expression (3+4)*(5+6). 4

(b) Construct syntax tree and postfix notation for the following expression :

$$(a+(b*c)\wedge d-e/(f+g)$$ 8

(c) Write quadruples, triples and indirect triples for the expression :

$$-(a*b)*(c+d)-(a+b+c)$$ 8

(d) Write down the translation procedure for control statement. 8

## Unit-IV

**4.** (a) What is Activation Record? Write the various fields of activation record. 4

(b) Write the definition of symbol table and procedure to store the names in symbol table. 8

(c) Explain the storage organization with simple examples. 8

(d) Explain storage allocation strategies with suitable examples. 8





## Unit-V

**5.** (a) What are the properties of code generation phase? 4

(b) Consider the following basic block :

B10 :

S1 = 4 × 1

S2 = addr (A) – 4

S3 = S2 [S1]

S4 = 4 × 1

S5 = addr (B) – 4

S6 = S5[S4]

S7 = S3 × S6

S8 = PROD + S7

PROD = S8

S9 = I + 1

I = S9

If I <= goto L10

Draw a directed acyclic graph and identify local common sub-expressions. After eliminating the common sub-expressions, re-write the basic block. 8

(c) Write short notes on : 8

(i) Simple code generator

(ii) Register allocation

(d) Explain the target machine architecture. 8