Printed Pages: **Sub Code:**ECS603

Paper Id: [ ][ ][ ][ ][ ][ ] **Roll No.** [redacted]

B. Tech.
(SEM VI) CARRY OVER THEORY EXAMINATION 2017-18
Compiler Design

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.
2. Any special paper specific instruction.

SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

a) what is translator?
b) Differentiate between compiler and assembler.
c) Discuss conversion of NFA into a DFA . also give the algorithm used in this conversion.
d) Write down the short note on symbol table.
e) Describe Data structure for symbol table .
f) What is mean by Activation record
g) What is postfix notations ?
h) Define Three address Code

i) What are Quadruples.
j) what do you mean by regular expression?

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30

a). Write down the regular expression for

1. The set of all string over {a,b} such that fifth symbol from right is **a**.
2. The set of all string over {a,b} such that every block of four consecutive symbol contain at least two zero.

b). Construct the NFA for the regular expression $a/abb/a^*b^+$ by using Thompson's construction methodology.

c). Eliminate left recursion from the following grammar

S→AB , A→BS | b , B→SA | a

d). Discuss conversion of NFA into a DFA . also give the algorithm used in this conversion.

e). Explain non recursive predictive parsing. Consider the following grammar and construct the predictive parsing table

E→TE'

E'→+TE'|€

T→FT'

T'→*FT'|€

F→F*|a|b

SECTION C

3. Attempt any *one* part of the following: 10 x 1 = 10

a). Give Operator –precedence parsing algorithm. Consider the following grammar and build up operator precedence table. Also parse the input string (id+(id*id))

E→E+T|T

T→T*F|F

F→(E)|id

b). For the grammar

S→aAd |bBd |aBe |bAe A→f , B→f

Construct LR(1) Parsing table .also draw the LALR table from the derived LR(1) parsing table.

4. Attempt any *one* part of the following: 10 x 1 = 10

a). What is postfix notations ? translate (C+D)*(E+Y) into postfix using syntax directed translation scheme(STDS)

b). consider the following grammar E→E+E | E*E|(E)|id . construct the SLR parsing table and suggest your final parsing table.

5. Attempt any *one* part of the following: 10 x 1 = 10

a). Explain logical phase error and syntactic phase error . also suggest methods for recovery of error.

b). Generate three address code for C[A[I, j]] = B[I ,j]+C[A[I , j]]+D[I + j] (You can assume any data for solving question , if needed) Assuming that all array elements are integer. Let A and B a 10 X 20 array with low1 =low2=1.

6. Attempt any *one* part of the following: 10 x 1 = 10

a). Give the algorithm for the elimination of local and global common Sub expression . discuss the algorithm with the help of example also.

b). consider the following three address code segments

PROD := 0

I:= 1

T1:=4*I

T2:=addr(A)-4

T3:=T2[T1]

T4:=addr(B)-4

T5:=T4[T1]

T6:=T3*T5

PROD:=PROD +T6

I:=I+1

If i<=20 goto (3)

a. Find the basic blocks and flow graph of above sequence.
b. Optimize the code sequence by applying function preserving transformation and loop optimization technique.

7. Attempt any *one* part of the following: 10 x 1 = 10

a). . Write short note on

i. Loop optimization
ii. Global data analysis

b). . Write short note on

i. Direct acyclic graph
ii. YACC parser generator