| Printed Pages:02 | Sub Code:ECS603 |
|---|---|

Paper Id: | 1 | 1 | 0 | 6 | 0 | 3 |　　　　Roll No. ▮▮▮▮▮▮▮▮▮▮▮

## 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))

$$E \rightarrow E+T \,|\, T$$

$$T \rightarrow T*F \,|\, F$$

$$F \rightarrow (E) \,|\, id$$

 b). For the grammar

$$S \rightarrow aAd \,|bBd\,|aBe\,|bAe \qquad A \rightarrow f \;,\; B \rightarrow f$$

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  $E \rightarrow E+E \,|\, E*E\,|\,(E)\,|\,id$ . 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