Roll No. .......................

Total Pages : 3

**BT-6/M-23**

**46165**

COMPILER DESIGN
Paper–PC-CS-302A

Time : Three Hours]

[Maximum Marks : 75

**Note :** Attempt any *five* questions, selecting at least *one* question from each unit.

## UNIT–I

1. (a) What is Regular Expression ? Write an algorithm to convert regular expression into NFA. **9**

   (b) Draw NFA for the Regular Expression a(a + b)*ab.

   (c) Draw NFA for a + b + ab.

   (d) Draw NFA corresponding to (0 + 1)*1(0 + 1).

   (2+2+2)

2. What are different phases of compiler and explain the role of different phases. **15**

## UNIT–II

3. (a) What is parsing? Explain top, down and bottom up parsing with the help of example. **9**

   (b) E - - - → T
   T - - - → T*F
   T - - - → id
   F - - - → T
   F - - - → id

Draw parse tree representation of above expression for id*id.

6

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4.  What is LALR(1) parsing ? Draw DFA and parsing table for the following equation :

S - - - → AA

A - - - → aA

A - - - → b.                                                                 15

## UNIT–III

5.  (a)  What is heap allocation and stack allocation? Prove it by taking an appropriate example.                10

    (b)  What are different issue is designing of code generator?                                               5

6.  What is DAG and write its algorithm ? For the following statements :

    1.  Sl:=4*i

    2.  S2:=a[Sl]

    3.  S3:=4*i

    4.  S4:=b[S3]

    5.  S5:=S2*S4

    6.  S6:=prod*S5

    7.  S7:= i+1

    i:=S7

    if i<=20 goto 1                                                            15

## UNIT–IV

7. What are different source of optimization ? Explain the following optimization in detail with example :

   (a) Machine independent optimization.

   (b) Loop optimization.

   (c) Peephole optimization.                    15

8. What is Global data flow analysis ? Explain Storage organization, static storage management and heap storage management with the help of example.          15

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