Total No. of Questions : 10]

SEAT No. : [ ]

P1767

[Total No. of Pages : 4

[5460] - 597
T.E. (IT)
SYSTEMS PROGRAMMING
(2015 Pattern) (Semester - II)

Time : 2½ Hours] ***[Max. Marks :70***

Instructions to the candidates:

1) ***Answer Q1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data if necessary.***

Q1) Perform Pass I and Pass II of assembler for the given assembly language program. Assume instruction length of 1 byte. **[10]**

```
        START 1500
        READ LAB
LOOP    MOVER AREG, A
        MOVER BREG, = '1'
A       EQU LOOP+5
        LOAD B
        ORIGIN A +10
        LTORG
B       MOVER CREG, = '2'
        STORE D
        MOVEM AREG, = '1'
LAB     DS 10
        STOP
        END
```

OR

P.T.O.

Q2) a) Explain overlay structure and subroutine linkage w.r.t. loaders. **[6]**

b) Define the following : **[4]**

i) Forward referenced symbol

ii) Pattern and Lexeme

iii) Macroprocessor

Q3) a) For the given 'C' code, generate the output of lexical analysis. **[6]**

```
// My first C Program
Void main ( )
{
    int i, j;
    clrscr( );
    scanf("%d %d",&i,&j);
    while (i <= j)
    {

        i++;
        j--;
    }

printf("C Programming!");

getch( );}
```

b) Define loader and explain its functions. **[4]**

OR

Q4) a) Explain different parameter passing methods used in macroprocessors. **[5]**

b) Convert the given RE to its equivalent DFA : **[5]**

(a + b)*.a

Q5) a) For the given grammar, construct the SLR parser and parse the string (a,(a,a)) **[8]**

$S \rightarrow (L) / a$

$L \rightarrow L, S / S$

b) Explain with example the problem of left factoring of grammar in parsers. **[4]**

c) With neat diagram explain classification of parsers. **[6]**

OR

Q6) a) Consider the following grammar. **[10]**

$S \rightarrow Aa / bAc / Bc/bBa$

$A \rightarrow d$

$B \rightarrow d$

Construct CLR parser and parse for the string "bdc" and "bc".

b) Define handle. Where is the concept of handle pruning used? For the given grammar, generate the string +*aaa
And identify the handles at each stage. **[4]**

$S \rightarrow +SS/*SS/a$

c) Differentiate between SLR and LALR parsers. **[4]**

Q7) a) Define the following : **[4]**

i) Syntax Directed Definition

ii) Syntax Directed Translation

iii) Synthesized Attributes

iv) Inherited Attributes

b) For the given grammar. **[6]**

$D \rightarrow TL$

$T \rightarrow int / real$

$L \rightarrow L, id/id$

Show the annotated parse tree for the statement real x_1, x_2;

c) Define dependency graph and for the annotated tree generated in Q7b) draw the dependency graph. **[6]**

OR

Q8) a) Explain dynamic allocation strategies. **[6]**

b) Show DAG, quadruple and triple for the given expression : **[6]**

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

c) Generate three address code for **[4]**

If (a>b) then x = y + z

else p = q - r

Q9) a) i) prod = 0

ii) i = 1

iii) $t_1 = 4 * i$

iv) $t_2 = a[t_1]$

v) $t_3 = 4 * i$

vi) $t_4 = b[t_3]$

vii) $t_5 = t_2 * t_4$

viii) $t_6 = prod + t_5$

ix) $prod = t_6$

x) $t_7 = i + 1$

xi) $i = t_7$

xii) if i < = 20 goto(3)

Show the basic flow graph for the given code. Explain the rules for forming the blocks. **[4]**

b) Explain machine dependent and independent optimization techniques. **[8]**

c) Discuss machine dependent issues for code generation. **[4]**

OR

Q10) a)

i = 4	i = 4	i = 4
$t_1 = i + 1$	$t_1 = 5$	$t_1 = 5$
$t_2 = b[t_1]$	$t_2 = b[t_1]$	$t_2 = b[5]$
$a[t_1] = t_2$	$a[t_1] = t_2$	$a[5] = t_2$

Perform machine independent code optimization techniques on the given code. **[8]**

b) Discuss code generation issues. **[4]**

c) Write a note on activation record. **[4]**

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