

Total No. of Questions : 10]

SEAT No. :

P2621

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[Total No. of Pages : 4

T.E. (I.T.)

SYSTEMS PROGRAMMING

(2012 Course) (Semester - II) (314450)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Answer Q.1 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 indicate full marks.*
- 4) *Assume suitable data, if necessary.*

Q1) a) Give the various data structures in the design of pass-1 of a Two-pass direct linking loader. **[4]**

b) What are the assembler directives? Explain how assembler directives LTORG, ORIGIN and EQU are processed in first pass. **[6]**

OR

Q2) a) For the 'C' code given below, give the different tables that would be generated as output of lexical analysis. **[8]**

main ()

```
{   Float average ;  
    int i, sum , n = 10;  
    sum = 0;  
    clrscr();  
    printf("Average of 10 nos. : %f",avg);  
    for (i = 1; i <= 10; i++)  
        Sum = sum +i;  
    avg = sum / (float) n;  
}
```

b) Define macroprocessor and assembler. **[2]**

P.T.O.

- Q3) a)** For the following piece of assembly language code, show the contents of MDT, MNT, IC and EC, **[5]**

```
MACRO
INCR & ARG
LOAD 1,&ARG
ADD 1, = F'1'
STORE 1,&ARG
MEND
MACRO
DECR & NUM
LOAD 2, &NUM
SUB 2, = F'1'
STORE 2, & NUM
MEND
START
DECR D1
STORE AREG, D1
INCR D2
D1 DC '50'
D2 DC '100'
END
```

- b) Define loader and enlist the basic functions of loader. **[5]**

OR

- Q4) a)** Using the algorithm convert the following regular expressions to DFA:
(a.b)*.a.# **[6]**

- b) Explain different parameter passing mechanisms in macro-processor. **[4]**

Q5) a) Consider the grammar [6]

$$E \rightarrow E-E$$

$$E \rightarrow E/E$$

$$E \rightarrow id$$

Perform shift Reduce parsing of i/p string “id – id/id”

b) Explain recursive descent parser for the given grammar to derive the string cad

$$S \rightarrow cAd$$

$$A \rightarrow ab/a$$

[6]

c) Compare bottom UP and top down parser. [6]

OR

Q6) a) Consider the following grammar [10]

$$S \rightarrow S(S)S/\epsilon$$

Construct SLR parser and parse for the string (a,(a,a))

b) Explain YACC file structure. [4]

c) Compare SLR, CLR and LALR parsers. [4]

Q7) a) Write down Syntax Directed Translation for assignment statement. [6]

b) For the grammar [6]

$$D \rightarrow TL$$

$$T \rightarrow int/real$$

$$L \rightarrow L,id/id$$

Draw an annotated parse tree for the statement real x_1, x_2 ;

c) Write the method of generating intermediate code for the expression

If (condition) then $p = q$ Else $x = y + z$ [4]

OR

- Q8)** a) Define Syntax directed definition and syntax directed translation. [4]
 b) Design dependency graph for the following grammar [6]

$$E \rightarrow E+T/T$$

$$T \rightarrow T*F/F$$

$$F \rightarrow \text{id}$$

The expression given is : $5*8-10$

- c) For the following expression write its postfix expression, draw DAG and write three address code: [6]

$$((x+y)-((x+y)*(x-y)))+(x+y)*(x-y)$$

- Q9)** a) Compare between static, stack & heap allocation. [4]
 b) With examples explain code generation issues. [6]
 c) What are the different techniques of storage allocation. [6]

OR

- Q10)** a) With examples explain at least four machine independent code optimization techniques. [8]
 b) Which are the machine dependent code optimization issues. [8]

x x x