

Total No. of Questions : 10]

P2621

[5153]-597

T.E. (i.T.)

SEAT No. :

[Total No. of Pages : 4

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 AREC, 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 [6]

$$S \rightarrow cAd$$

$$A \rightarrow ab/a$$

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]

$$D \rightarrow FL$$

$$T \rightarrow int/real$$

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

Draw an annotated parse tree for the statement real x₁, x₂;

c) Write the method of generating intermediate code for the expression [4]

If (condition) then p = q Else x = y + z

OR

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

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

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

$$F \rightarrow id$$

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]

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