

Total No. of Questions :6]

SEAT No. :

P108**APR. -16/TE/Insem. - 45**

[Total No. of Pages :3

T.E. (Information Technology)**SYSTEMS PROGRAMMING****(2012 Pattern) (314450) (Semester - II)***Time : 1Hour]**[Max. Marks :30**Instructions to the candidates:*

- 1) *Answer Q1 or Q2, Q3 or Q4, Q5 or Q6.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume Suitable data if necessary.*

Q1) a) Generate symbol table, literal table, pool table, Intermediate code and Target Code for the given assembler program. Assume a hypothetical instruction set with every instruction of length 1. **[8]**

```

START 100
A DS 05
LOAD A
ADD AREG, ='5'
MULT BREG, ='10'
TRANS L
L2 PRINT L1
LTORG
L ADD AREG, ='5'
SUB BREG, ='15'
ADD B
B EQU L + 10
ORIGIN L2+20
L1 DS 5

```

P.T.O.

C DC 10
 STOP
 END

- b) Define the term forward reference and explain w.r.t. the example in Q1.a) [2]

OR

- Q2) a)** Enlist and explain various data structures required for design of 2-pass assembler. [4]

- b) Perform single pass macroprocessor algorithm and generate expanded code for the given code: [6]

MACRO

M2

AR 2,3

SR 4,4

MACRO

M1 &S1

AR 3,3

&S1 X

SR 4,4

L 1, = F'4'

DC A(X)

L 2, = V(&SI)

BALR 14,15

MEND

MEND

START

AR 1,1

M2

SR 2,2

M1 PQR

END

- Q3)** a) Define loader and enlist the basic functions of loader. [4]
 b) Explain transfer vector and relocation bits w.r.t BSS loader and compare BSS loader with absolute loader. [6]

OR

- Q4)** a) What information must be supplied by an assembler to the direct linking loader (DLL). Explain the significance of this information w.r.t design of DLL. [5]
 b) Explain the design of absolute loader. [5]

- Q5)** a) Explain the first three phases of compiler w.r.t the following statement: [5]
 $r = a - 10 / (c * d ^ e)$

Note: ^ is exponentiation operator.

- b) For the given piece of code perform lexical analysis and generate various tables, void main () [5]

```
{
    float rad, area;
    int i = 0;
    clrscr ( );
    printf("Welcome to C programming!");
    i++;
    printf("%d", i);
    getch ( );
}
```

OR

- Q6)** a) Using the RE to DFA algorithm generate the DFA for the given regular expression [8]

$(a/b) * a * b$

- b) Lexical analyzer builds an UST. What is the need of this table? [2]

