

Total No. of Questions—12]

[Total No. of Printed Pages—8

<b>Seat No.</b>	
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**T.E. (Information Technology)**  
**(Second Semester) EXAMINATION, 2014**  
**SYSTEM SOFTWARE PROGRAMMING**  
**(2008 PATTERN)**

**Time : Three Hours**

**Maximum Marks : 100**

- N.B. :—** (i) Answer Q. No. 1 or Q. No. 2, Q. No. 3 or Q. No. 4, Q. No. 5 or Q. No. 6 from Section I and Q. No. 7 or Q. No. 8, Q. No. 9 or Q. No. 10, Q. No. 11 or Q. No. 12 from Section II.
- (ii) Answers to the two Sections should be written in separate answer-books.
- (iii) Neat diagrams must be drawn wherever necessary.
- (iv) Figures to the right side indicate full marks.
- (v) Assume suitable data if necessary.

**SECTION I**

1. (a) Enlist and explain various data structure required for design of two pass assembler. [6]
- (b) Draw flowchart for activity of pass II of two pass assembler. [6]
- (c) What are pros and cons of a single pass assembler ? [6]

P.T.O.

*Or*

- 2.** (a) Write an algorithm for pass I of two pass assembler with suitable example. [10]
- (b) Say true *or* false and justify your answer : [8]
- (i) Single pass assembler can handle forward reference.
- (ii) Error “symbol used but not defined”, can be detected during pass I of two Pass assembler.
- (iii) Assembler directive get translated into object code.
- (iv) The literal used in assembly language get memory allocated only after END.
- 3.** (a) Explain with example the following macro facilities : [8]
- (i) Expansion time loops.
- (ii) Change of flow during expansion.
- (b) Write an algorithm for pass I of two pass macro processor with suitable example. [8]

*Or*

4. (a) Explain with example, various parameters passing mechanism in macro processor. [4]
- (b) Compare macro and subroutine. [4]
- (c) Consider the following code segment : [8]

MACRO

INCR &X, &Y, &REG=AREG

MOVER &REG, &X

ADD &REG, &Y

MOVEM &REG, &X

MEND

MACRO

DECR &A, &B, &REG=BREG

MOVER &REG, &A

SUB &REG &B

MOVEM &REG, &A

MEND

START 100

READ N1

READ N2

INCR N1, N2, REG=CREG

DECR N1, N2

STOP

N1 DS 1

N2 DS 1

END

Show the content of :

(i) Macro Name Table

(ii) Macro definition table

(iii) Expanded source code

5. (a) Consider the following grammar : [6]

$$S \rightarrow aAcBe$$
$$A \rightarrow Ab|b$$
$$B \rightarrow d$$

Parse the string “abcde” using shift reduce parser.

(b) Explain the recursive decent parser by taking appropriate example. [6]

(c) What is ambiguous grammar ? Explain with example. [4]

*Or*

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

```
main( )  
  
 {  
  
     int i, sum, n;  
  
     float avg;  
  
     n=0; sum=0;  
  
     for (i=1; i<=10; i++)  
  
         sum= sum + I;  
  
     avg= sum / (float) n;  
  
 }
```

(b) With the help of suitable example, explain the problems of top-down parser. [8]

## SECTION II

7. (a) Differentiate between machine dependent and machine independent optimization techniques in compiler. Explain in brief any *one* of these techniques. [8]
- (b) Explain the importance of intermediate code generation in compiler. [4]
- (c) Write the triple form for  $X = ++ Y * Z$ . [4]

*Or*

8. (a) Explain the following machine independent code optimization techniques : [12]
- (i) Common sub-expression elimination
- (ii) Loop Invariants
- (iii) Constant Folding
- (iv) Strength Reduction.
- (b) Give Postfix, Triple and Quadruple form of :

$$A = (-C + D) / (-P * (-Q + R)) \quad [4]$$

9. (a) Draw a flowchart for Pass-I of a two pass direct linking loader. [8]
- (b) Compare : [8]
- (i) Relocating loader Vs. Absolute loader
- (ii) Dynamic loading Vs. Dynamic linking.

*Or*

10. (a) Explain Binary Symbolic Subroutine (BSS) loading scheme with example. Discuss how allocation, reallocation, linking and loading is done in this scheme. [8]
- (b) Explain the following : [8]
- (i) Linkage Editor
- (ii) Overlay Structure.
11. (a) With the help of diagram, explain user interface and its use in software application. [6]
- (b) State merits and demerits of line and screen editors. Name any *two* Line and Screen editors. [6]
- (c) Write the significance of debug monitor. [6]

*Or*

**12.** (a) Explain the following language processing tools : [10]

(i) LEX

(ii) YACC

(b) With the help of a neat block diagram explain the structure of screen editor. [8]