



**T.E. (Information Technology) (Semester – II) Examination, 2011**  
**SYSTEM SOFTWARE PROGRAMMING**  
**(2008 Pattern) (New)**

Time : 3 Hours

Total Marks : 100

- Instructions :** 1) Answer 3 questions from Section I and 3 questions from Section II.
- 2) Answers to the two Sections should be written in separate books.
- 3) Neat diagrams must be drawn wherever necessary.
- 4) Black figures to the right indicate full marks.
- 5) Use of electronic pocket calculator allowed.
- 6) Assume suitable data, if necessary.

**SECTION – I**

1. a) Explain with example, the difference between literal and symbol. How are they treated by assembler ? 6
- b) What feature of assembly makes it mandatory to design a two pass assembler ? Explain with example. 6
- c) Enlist the different types of errors that are handled by Pass I and Pass II of two pass assembler. 6

OR

2. a) For the following piece of assembly language code, show the contents of symbol table, literal table and pool-tab. Assume size of instruction equal to one.

START 100

A DC 01

MOVER AREG, A

ADD AREG, '=3'

MULT AREG, '=10'

BC GT, L

LTORG

L ADD AREG, '=4'

ADD BREG, B

B DS 1

END

8

P.T.O.



b) i) Explain the term back-patching. 2

ii) Can single pass assembler resolve forward reference. Justify your answer with appropriate example and data structure needed. 8

3. a) Explain following terms with macro :

i) Expansion time variables

ii) Conditional assembly

iii) Keyword and positional parameters. 10

b) Can macro processing be incorporated in an assembler. Justify your answer. 6

OR

4. For the following assembly language code, show the contents of macro name table, macro definition table. Finally write down the code after macro expansion.

MACRO

EVAL &X, &Y, &Z

AIF (&Y EQ &Z). ONLY

LOAD &X

SUB &Y

ADD &Z

AGO .OVER

.ONLY LOAD & Z

.OVER MEND

MACRO

MAJOR &W1, &W2, &W3, &W4, &W5, &W6

EVAL &W1, &W2, &W3

~~STORE &W6~~

STORE &W6

EVAL &W4, &W5, &W6

MEND

START

MAJOR A, B, C, D, E, F

END



5. a) Explain the role of Lexical Analyser in compiler design. List the types of errors reported during lexical analysis phase of compiler. 6
- b) Construct a left most derivation for the string “ibtibtaea” using the grammar
- $S \rightarrow i \text{ CtS}$
- $S \rightarrow i \text{ CtSeS}$
- $S \rightarrow a$
- $C \rightarrow b$
- Draw the parse tree also. 4
- c) Explain the problems/difficulties that are faced during Top Down Parsing. 6
- OR
6. a) Explain working of Recursive Descent Parser with an example. 8
- b) Write short notes on :
- i) Cross compiler
- ii) Boot strap compiler. 8

## SECTION – II

7. a) Give postfix, tripple and quadruple form of  $A = (-C + D)/(-P * (-Q + R))$ . 6
- b) Explain following machine independent code optimization techniques.
- i) Common subexpression elimination
- ii) Loop Invariants
- iii) Constant folding. 12
- OR
- 8.a) Explain the importance of intermediate code generation in compiler. 4
- b) Explain the term activation record and explain its use in storage allocation. 8
- c) Explain any one technique of machine dependent code optimization. 6



9. a) Draw the flow chart for Pass II of direct linking loader. 12  
b) List four basic functions of loader. 4

OR

10. a) Compare following :  
i) Dynamic loading Vs dynamic linking  
ii) Image builder Vs linkage editor  
iii) Compile and go loader Vs absolute loader. 6  
b) Mention four basic functions of the loader and explain how these functions are performed by absolute loader. 10
11. a) Explain following language processing tools:  
i) LEX  
ii) YACC. 6  
b) Explain significance of Debug monitor. 4  
c) With the help of diagram, explain user interface and its use in software application. 6

OR

12. a) List various types of editors. Explain line editor and give its merits and demerits. 8  
b) Write short note on “Testing and tools for program testing”. 8