



May - June - 2011

TE - IT

Sem - II

[3963] -366

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

Time : 3 Hours

Max. Marks : 100

N.B. : i) Answer **three** questions from Section I and **three** questions 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** indicate **full** marks.

v) **Use** of Electronic pocket calculator is **allowed**.

SECTION – I

1. a) Define the following terms

4

i) Compiler

ii) Loader

iii) Interpreter

iv) Macroprocessor

b) Assume the instruction opcodes for assembly mnemonic as given below :

Instruction opcode	Mnemonic	Length
00	STDP	1
01	ADD	1
02	SUB	1
03	MULT	1
04	MOVER	1
05	MOVEM	1
06	BC	1

P.T.O.



Generate Literal table, symbol table, intermediate code (using variant I) and target code, for the assembly language code given below :

	START 200
	MOVER AREG, = 'S'
	MOVEM AREG, A
LOOP	MOVER AREG, A
	MOVER CREG, B
	ADD CREG, = '1'
	BC ANY, NEXT
	LTORG
NEXT	SUB AREG, = '1'
	BC LT, BACK
LAST	STOP
	ORIGIN LOOP + 2
	MULT CREG, B
A	DS 1
BACK	EQU LOOP
B	DS 1
	END

12

OR

2. a) Say true or false and justify your answer :

8

- i) Single pass assembler can handle forward references.
- ii) Error, "symbol used but not defined" can be detected during pass I of two pass assembler.
- iii) Assembler directives get translated into object code.
- iv) The literals used in assembly language get memory allocated only after END.

b) Draw the flowchart of activities of pass I of two pass assembler.

8

3. a) In an assembly language program certain action is required at ten different places. Under what conditions would you code this as i) Macro ii) Subroutine ? Justify your answer.

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b) Explain with example following macro facilities :

i) Expansion time Loops

ii) Change of flow during macro expansion.

8

c) Explain with example, different types of parameters that are used in macro processor.

6

OR



4. Show macro name table, macro definition table and final expanded code for the assembly language code given below :

18

```
MACRO
XYZ      & A
ST      1, & A
MEND
MACRO
MPLS      & Z
MACRO
&Z      & W
AR      4, & W
XYZ      ALL
MEND
ST      & Z, ALL
MEND
PROG START
USING      *, 15
MPLS      HELLO
ST      2,3
HELLO      YALE
YALE EQU      5
ALL DC      F'3'
END
```

5. a) Compute FIRST and FOLLOW for the grammar given below :

6

```
E → TE '
E' → + TE' / ε
T → FT '
T' → * FT' / ε
F → (E) /id
```

- b) Distinguish between top down and bottom up parsers.
c) Explain with example the term ambiguous grammar.

6

4

OR

6. a) Give regular expression / definition for white space, identifiers and simple integer constants. Explain how they are used in recognizing the corresponding tokens support your answer with transition diagram.
b) For the 'C' code given below, give the different tables that would be generated as output of lexical analysis.

6

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

10



SECTION – II

7. a) Explain the processing of all phases of compiler with respect to the assignment statement given below. Clearly mention input and output of each phase.

$$p = i * r / 30$$

where i is integer variable while p and r are float type variables.

12

- b) Explain any two machine dependent code optimization techniques used in compilers.

4

OR

8. a) Write a short note on activation record.

4

- b) Discuss code generation issues.

8

- c) Write three address code for following statement and give its triple and quadruple representation.

4

$$A = -B * (C + D)$$

9. a) Write **true** or **false** :

- i) In absolute loader scheme allocation is done by loader.
- ii) In absolute loader scheme linking is done by programmer.
- iii) In BSS loader scheme relocation is done by loader.
- iv) In BSS loader scheme linking is done by programmer.

4

- b) Explain compile and go loader scheme.

8

- c) Explain with flow chart design of absolute loader.

6

OR

10. a) Give the flow chart for pass I of direct linking loader.

12

- b) Explain following terms

- i) Overlays
- ii) Dynamic Linking.

6

11. a) What are various types of editors ? With the help of block diagram, explain typical Editor Structure.

10

- b) Give importance of user Interface in any software application. Give structure of user interface.

6

OR

12. a) Give different sections of files that are given as input to Lex and Yacc. Also explain how Lex and Yacc communicate with each other.

12

- b) Write a short note on Debug Monitor.

4