Reg. No.										

MANIPAL UNIVERSITY
SCHOOL OF INFORMATION SCIENCES

SECOND SEMESTER MASTER OF ENGINEERING – **ME** (EMBEDDED SYSTEMS) / FOURTH SEMESTER MSc Tech (EMBEDDED SYSTEMS) / THIRD SEMESTER MSc Tech (EMBEDDED SYSTEMS & INSTRUMENTATION – ESIGELEC, France)
DEGREE EXAMINATION – APRIL / MAY 2016

SUBJECT: ESD 610 / ESI 603– SYSTEM SOFTWARE

Wednesday, May 4, 2016

Time: 10.00 – 13.00 Hrs. Max. Marks: 100

1. Describe the structure of the various tables used in the design of an assembler. (10 marks)

2. How can we define macros within macros? Give a suitable example. (10 marks)

3. Describe the activities in a) Lexical Analysis Phase b) Syntax Analysis Phase of a complier. (2x5=10 marks)

4. Draw the NFA for (a|b)*abb and show how it can be converted to a DFA. (10 marks)

5. Give a CFG for C language function prototype declaration. Functions can take any number of parameters including arrays. (10 marks)

6. List the problems encountered while designing a top-down parser. How do we tackle them? (5+5=10 marks)

7. Consider the grammar

$S \rightarrow L = R$

$S \rightarrow R$

$L \rightarrow *R$

$L \rightarrow id$

$R \rightarrow L$

Whether the grammar is SLR(1) grammar. Justify your answer. (10 marks)

8. For the following code:

```
n = 0;

i = 0;

for (n=0; n < 15; i++) {

  if (a[i] == a[i+1]) {

    a[i] = a[i] + n;

  }

  n++;

}
```

Obtain three address code.

(10 marks)

9. What are the various loop optimization techniques that can be applied to intermediate code. Illustrate with an example.

(5+5=10 marks)

10. Write short notes on Lex. Show the structure of a lex program. Discus any five meta characters that form regular expressions in lex.

(5+5=10 marks)

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