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MCA Semester IV End Term Examination

MC-21 System Software

Date: May 13, 2014 **Time:** 3 Hrs **Total Marks: 50**

Q – 1. A. Define Grammar and give the classification of grammar? [02]

B. Discuss the front end of compiler giving its schematic diagram? [03]

OR

B. Discuss the back end of compiler giving its schematic diagram? [03]

C. Give full form of following (**Any Five**)- [05]

1. IR 3. LEX 5. DFA
2. LEA 4. STT 6. AD

Q – 2. A. What are the kinds of parameters used in macro? Explain each of them? [03]

B. What are Expansion time statements? Explain each of them with examples? [03]

C. Explain data structures used in a macro preprocessor through an example? [04]

OR

A. Explain the data structures used in Linker through an example? [03]

B. What are Triples and Quadruples? Show their representation for the string a + b ^ c * d – e * f / g + h [03]

C. What is code optimization? Describe **any 3** methods of it. [04]

Q – 3. A. For which purpose LTORG and ORIGIN statements are used in assembler and REPT statement used in macro. [03]

B. Find the validity of the string – "**The paper contains a nice question**" in the following grammar – [03]

<Article>	=	a | an | the
<Noun>	=	paper | question
<Verb>	=	contains
<Adjective>	=	nice | difficult
<Adjective Phrase>	=	<Article> <Adjective>
<Noun Phrase>	=	<Adjective Phrase> <Noun>
<Verb Phrase>	=	<Verb> <Noun>
<Sentence>	=	<Noun> <Verb Phrase> <Noun Phrase>

C. Develop DFA and STT for the string $\mathbf{1\,2^{*}\,3^{+}}\,4\,5\,\mathbf{6^{*}\,7^{*}\,8^{+}}\,9^{*}$ [04]

Q – 4. A. Differentiate between Variant-I and Variant-II IC of assembler? [02]

B. Write the grammar of LL(1) parsing and show the parsing steps for the string "s + s – s * s / s". [03]

OR

B. Write the grammar of Recursive Descent parsing and show the parsing steps for the string "s + s + s + s * s * s * s * s". [03]

C. Given the following program, create Pass-II IC [05]

```
        START 600
L1      MOVER   BREG, NUM1
        ADD     BREG, = '11'
L2      SUB     AREG, ='22'
        ORIGIN  L1 + 100
        LTORG
        ADD     AREG, = '33'
L3      EQU     L1
L4      EQU     L2
        SUB     CREG, = '44'
        MULT    NUM2, = '55'
```

```
                ORIGIN      L3 - 100
                LTORG
L5              MOVER       CREG, = '66'
                ORIGIN      L3 - 400
                DIV         NUM2,='77'
                MOVER       DREG, ='88'
                LTORG
                SUB         DREG, = '99'
NUM1            DS          13
NUM2            DS          5
                END
```

Q – 5. A. Explain different types of Editors? [02]

B. Which are parameter passing (calling) mechanisms? Explain. [03]

C. Show the object modules of linker & NTAB for program M and N- [05]

PROGRAM - M

```
                        START 400
                        ENTRY SUM1, SUM2
                        EXTRN MAX, MIN
400)                    READ        SUM1
401)    LABEL1:         ADD         AREG, MIN
402)                    BC          GT, LABEL1
                        .
                        .
421)                    BC          ANY, LABEL2
422)    LABEL2:         PRINT       MAX
423)    SUM1            DS          5
428)    SUM2            DC          '10'
                        END
```

PROGRAM - N

```
                        START 700
                        ENTRY MAX
                        EXTRN SUM1
700)    LABEL3:         ADD         AREG, SUM1
701)                    BC          GT, LABEL3
                        .
                        .
724)                    PRINT       MAX
725)    MAX             DC          '20'
                        END
```

---------- All the Best ----------