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MCA-15/M.Sc. (IT)-15

System Software

Master of Computer Applications/Master of Science in Information Technology

(MCA/MSc. IT-11/12/16/17)

Fourth Semester

Examination, 2019

Time : 3 *Hours* *[Maximum Marks : 80*

Note : This paper is of Eighty (80) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein.

Section–A

(Long Answer Type Questions)

Note : Section A contains Five (05) long-answer-type questions of Fifteen (15) marks each. Learners are required to answer any three (03) questions only. **(3×15=45)**

1. Explain the phases related to a compiler.

2. Explain the concept of non-deterministic finite automata.
3. Write the procedure to convert DFA's to regular expression.
4. With the help of an example explain the difference between Type-0 and Type-2 grammar.
5. Answer the following : (3 marks each)
   (a) What is a file management system?
   (b) What is static and dynamic linking?
   (c) Why is syntax analysis performed?
   (d) Briefly distinguish between one pass and two pass assembler.
   (e) Explain in brief the functions of a linker.

Section–B

(Short-Answer-Type Questions)

Note : Section 'B' contains Eight (08) short-answer-type questions of Seven (07) marks each. Learners are required to answer any Five (05) questions only. **(5×7=35)**

1. Explain in brief the functions of a linker.

2. Answer the following :

   (a) What are the different levels in Chomsky hierarchy? (4 marks)

   (b) Differentiate between top down and bottom up parsing. (3 marks)

3. Answer the following :

   (a) Give two functions of preprocessor.

   (3 marks)

   (b) Define syntax tree? How is it created?

   (4 marks)

4. Consider the grammar :

   S->aSbS | bSaS | ∈

   (a) Construct the parse tree for aab.

   (3 marks)

   (b) What language is this grammar generator?

   (4 marks)

5. Answer the following :

   (a) Define one pass assemblers.

   (3 marks)

   (b) Distinguish between a linker and a loader with the help of examples. (4 marks)

6. Discuss the importance of LL(1) and LR parser.

7. What are the 'basic code optimization techniques'? Explain.

8. Answer the following :

   (a) What is assembler? What are the differences between compiler and assembler? Explain. (4 marks)

   (b) Explain role of lexical analyzer.

   (3 marks)