

Roll No.

Total No. of Questions : 09]

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MCA (Sem.-5th)
COMPILER DESIGN

SUBJECT CODE : MCA - 503-B (N2) (Elective - II)

Paper ID : [B0125]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Attempt one question from each Sections A, B, C & D.
- 2) Section-E is **Compulsory**.
- 3) Use of non-programmable scientific calculator is allowed.

Section - A

(1 × 10 = 10)

- Q1)** Describe the steps that a compiler takes to process a program?
- Q2)** Construct a DFA that recognizes strings of binary numbers which are multiples of 4 such as 100, 1000, etc?

Section - B

(1 × 10 = 10)

- Q3)** (a) How a parser handles syntax errors?
(b) Write down steps to create a dependency graph for a parse tree?
- Q4)** How a parser generator can be used to facilitate the construction of the front end of a compiler?

Section - C

(1 × 10 = 10)

- Q5)** Give a translation scheme that checks that an identifier should start with a capital letter and the same identifier should not appear twice in a list of identifiers?
- Q6)** (a) Discuss the methods for evaluating semantic rules?
(b) What is an annotated parse tree? Construct an annotated parse tree for the expression $2*7+5n$?

Section - D

(1 × 10 = 10)

- Q7)** Why the code is optimized? Discuss the peephole optimization?
- Q8)** What is a directed acyclic graph? Discuss the procedure for constructing a directed acyclic graph?

Section - E

(10 × 2 = 20)

- Q9)**
- a) What are the advantages of writing computer programs in a high level language?
 - b) What is Lexical Analysis?
 - c) Why type checking is performed?
 - d) What are the differences in a compiler and an interpreter?
 - e) How is a DFA different from a NFA?
 - f) What information is stored in an activation record?
 - g) What is a syntax tree?
 - h) How are context free grammars different from regular expressions?
 - i) What is the difference in these two regular expressions- a^+ and a^* ?
 - j) At which levels a program can be improved to improve its performance?

