No. of Printed Pages—2

90 (SS)

[20-HKPGDEO–M4S(O)21J]

MCA 4th Semester (Old) Exam., 2020

SYSTEM SOFTWARE

[MCA (S4) 16]

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Answer any *five* from the following questions : 2×5=10

(a) Write the function of control programs.

(b) Define macroinstructions.

(c) Define compiler.

(d) Differentiate between LR and LL parsers.

(e) Write the functions of pre-processors.

(f) Write the purpose of program loading.

2. Answer any *three* from the following questions : 4×3=12

(a) Describe the main functions of an operating system.

(b) Mention about the use of a linker. With a suitable diagram, explain the main functions of a linker.

(c) Consider the grammar

$$S \rightarrow aS|aSbS|\in$$

this grammer is ambiguous. Show that *aab* has two parse trees.

(d) Describe the various approaches of translation.

3. Answer any *three* from the following questions : 6×3=18

(a) What is parsing? Explain the top-down and bottom-up parsers with examples.

(b) Construct a grammar G to represent a language L which is a set of all palindromes over $\{a, b\}$.

(c) Explain the concept of non-deterministic finite automata (NFA), giving a suitable example.

(d) Discuss all the phases related to compiler.

4. Answer any *four* from the following questions : 10×4=40

(a) What are the main features of Windows NT? Discuss them.

(b) Illustrate about one-pass and two-pass assemblers. 5+5=10

(c) Name any four directives used in assembly language. Explain them.

(d) What does an abstract syntax tree represent? Write down about three-address code generation with an example. 3+7=10

(e) Define context-free grammar (CFG). Given a context-free grammar

$$G=\{V, T, P, S\}$$

where $T=\{a, b\}$, $V=\{s\}$, $P: S \rightarrow aSa \mid bSb \mid \in$. Generate the parse tree for any word of the grammar. 3+7=10

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