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SEM 6 BCA DSE 24

2024

(May)

COMPUTER APPLICATION

Discipline Specific

(System Programming)

Course Code : BCA-DS-T4-601

Credit : 4

Total Marks : 56

Time: $2\frac{1}{2}$ Hours

*The figures in the margin indicate full marks
for the questions*

1. Choose the correct answer:

$$1 \times 6 = 6$$

- (a) A program in execution is called

 - (i) Process
 - (ii) Instruction
 - (iii) Procedure
 - (iv) Function

(b) Which one of the following is a top-down parser?

 - (i) Recursive descent parser
 - (ii) Operator precedence parser
 - (iii) An LR(k) parser
 - (iv) An LALR(k) parser

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2. Answer the following:

$$2 \times 6 = 12$$

- (a) Differentiate between compiler and interpreter.
 - (b) Explain the concept of ambiguity in context-free grammars.
 - (c) Describe the role of a lexer in the compilation process.
 - (d) What is the significance of semantic analysis in the compilation process?
 - (e) Define register allocation in the context of code optimization.

Contd3

- (f) Discuss the importance of error handling during lexical analysis.
3. Answer the following: 3 X 6 = 18
- Explain the difference between a one-pass and a two-pass assembler.
 - Discuss the role of linker in combining object files and resolving external references.
 - Discuss the role of a lexical analyzer in the compilation process.
 - Describe the process of three-address code generation and its role in intermediate representations.
 - Compare and contrast stack allocation with other memory allocation techniques used in programming languages.
 - Critically evaluate the role of code generation in the overall performance of a compiler and suggest potential areas for improvement.
4. (a) Discuss the role of an absolute loader in the loading process. Explain the concepts of relocation and linking, highlighting their significance in executable file creation. 6
- Or*
- Discuss the concept of dynamic linking and its advantages over static linking. Provide a detailed explanation of how dynamic linking works and how it contributes to more efficient program execution. 6

Contd4

5. (a) Examine the good and bad sides of using yacc for parsing.
Use examples to explain your thoughts. 6

Or

- (b) Explain how lexical analysis transforms a stream of characters into tokens and builds the symbol table. Provide examples to illustrate the process of token specification and recognition. 6

6. (a) Compute FIRST and FOLLOW for the following grammar
8

$$S \rightarrow aBDH$$

$$B \rightarrow cC$$

$$C \rightarrow bC | \epsilon$$

$$D \rightarrow EF$$

$$E \rightarrow g | \epsilon$$

$$F \rightarrow f | \epsilon$$

Or

- (b) Construct the SLR parsing table from the following grammar
8

$$E \rightarrow E + T | T$$

$$T \rightarrow TF | F$$

$$F \rightarrow F * | a | b$$

— O —

(4)