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3 (Sem-6/CBCS) CSC HE 3

2022

**COMPUTER SCIENCE**

(Honours Elective)

Paper : CSC-HE-6036

**(System Programming)**

Full Marks : 60

Time : Three hours

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

1 Answer the following questions as directed :  
**(any seven)**  $1 \times 7 = 7$

(a) An imperative statement indicates an action to be performed during the execution of the assembled program.

(State true or false)

(b) Location of a literal can be specified in assembly program.

(State true or false)

(c) Overlays are used to reduce main memory requirement of a program.

(State true or false)

Contd.

(d) Which phase of a compiler decides that a statement is an assignment statement?

(i) Lexical analysis

(ii) Syntax analysis

(iii) Semantic analysis

(iv) None of the above

(Choose the correct option)

(e) Invalid characters are found during lexical analysis. (State true or false)

(f) An operator precedence parser is a

(i) top-down parser

(ii) bottom-up parser

(iii) None of the above

(Choose the correct option)

(g) The number of tokens in C language statement while (1); is         .

(Fill in the blank)

(h) In absolute loading scheme, which loader function is accomplished by assembler?

(i) Reallocation

(ii) Allocation

(iii) None of the above

(Choose the correct option)

(i) In a two-pass assembler the object code generation is done during the

(i) second pass

(ii) first pass

(iii) Not done by assembler

(Choose the correct option)

(j) LR(1) is a subset of LALR(1).

(State true or false)

2. Define the following terms : **(any four)**

2×4=8

(a) Assembler

(b) Assembler directive

(c) Loader

(d) Linker

(e) Semantic

(f) Token

(g) Abstract syntax tree

(h) Forward reference

3. Answer **any three** of the following questions :

5×3=15

(a) What are the tasks performed by the passes of a two-pass assembler? Explain briefly.

(b) What are the differences between static linking and dynamic linking?

(c) Write the advantages and disadvantages of the absolute loading.

(d) When would we prefer interpreter over compiler?

(e) Write a lex specification program to extract only comments from a C program and display the same on standard output.

- (f) What is the difference between top-down and bottom-up parsing?
- (g) Write a short note on yacc.
- (h) Construct three address codes for  $a := -b * (c + 3)$
4. Answer **any three** of the following questions:  $10 \times 3 = 30$
- (a) Write the algorithm of single-pass assembler.
- (b) Explain the data structures used in the pass 1 of a two-pass assembler.
- (c) What is relocating loader? Write the algorithm of relocating loader.
- (d) Draw and explain several phases of a compiler.
- (e) What is symbol table? What are the main functions a symbol table must implement? What are the attributes of a typical symbol table?  $2 + 4 + 4 = 10$
- (f) What is lookahead LR parser? Construct the DFA LALR (1) items for the grammar  $S \rightarrow S(S) | \epsilon$
- (g) What is activation record? How are registers allocated in code generation?  $5 + 5 = 10$
- (h) Explain different storage allocation techniques with their merits and demerits.