U.G. 6th Semester Examination - 2022
COMPUTER SCIENCE
[HONOURS]
Discipline Specific Elective (DSE)
Course Code : COM.SC-H-DSE-L-603
(System Programming)

Full Marks : 60   Time : $2\frac{1}{2}$ Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP - A

1. Answer any **ten** questions :   2×10=20

   a) What is the function of semantic analysis phase of compiler?

   b) Write a regular expression for an identifier.

   c) What are the benefits of intermediate code generation?

   d) Why Directed Acyclic Graph (DAG) is useful in compiler design?

   e) How 'compile and go' loader performs loading operation?

   f) Define LR(0) items.

   g) What is the advantage of using relocating loader?

   h) What are the benefits of using LR parser?

   i) Define ambiguous grammar.

   j) State the advantages of dynamic linking.

   k) Define basic block.

   l) What is left recursion?

   m) What is the role of a parser?

   n) Differentiate between top down and bottom up parsing techniques.

   o) What are the contents of a symbol table?

GROUP-B

Answer any **four** questions :   5×4=20

2. Define *token, pattern* and *lexeme* with example.

3. Explain the working principle of absolute loader along with its disadvantages.

4. Write a short note on YACC.

5. Briefly describe left factoring with example.

6. Explain activation tree with an example.

7. Differentiate between direct left recursion and indirect left recursion with example.

GROUP-C

Answer any **two** questions :   10×2=20

8. a) Generate three address code for the following statements assuming that all variables are stored in memory locations:

   x = b * c

   y = a + x

   b) Show that the following grammar:

   S -> S A | A

   A -> a

   is SLR(1).   4+6=10

9. a) Construct DAG for the following basic block:

   d = b * c

   e = a + b

   b = b * c

   a = e − d

   b) Explain the differences between syntax tree and parse tree with example.

   c) What are the main contributions of Syntax Directed Translation in Compiler?   4+3+3=10

10. Consider the context-free grammar:

    S -> S S + | S S * | a

    a) Show the leftmost derivation and rightmost derivation for the string *aa + a**.

    b) Draw the parse tree for the string *aa+aa***.

    c) Comment on the ambiguity of the grammar with justification.

    d) Describe the language generated by the grammar.

                          4+2+2+2=10

11. Write short notes on any **two** of the following:

                          5×2=10

    a) Activation record.

    b) Two pass assembler.

    c) Lex.

    _____