Hi-Tech Institute of Engineering & Technology

Department Of Computer Science

B.Tech. Subject Code: KCS502

Model Paper

(Sem – V), THEORY EXAMINATION-2023-24,

Subject Name: Compiler Design

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION-A

1. Attempt all question in brief. 2x 10 = 20

Q. No	Question	Marks	CO
a.	**What is YACC? Discuss about it.**	**2**	**1**
b.	**Design a DFA for the following regular expression: (x+y)*xyy**	**2**	**1**
c.	**State the problems associated with the top-down parsing.**	**2**	**2**
d.	**Discuss about Shift reducing parsing.**	**2**	**2**
e.	Find the postfix notation for the following expression: (a+b+c)*(c+q)	**2**	**3**
f	What is syntax directed translation (SDT) scheme for case statement?	**2**	**3**
g	Write short note on Activation record.	**2**	**4**
h	Discuss about has table.	**2**	**4**
i	What is an ambiguous grammar? Give example.	**2**	**1**
j	What is induction variable?	**2**	**5**

SECTION-B

2. Attempt any Three of the following: 10x3 =30

Q. No	Question	Marks	CO
a.	Construct the LALR parsing table for the given grammar S → BB B → aB/b	**10**	**2**
b.	Construct the minimized DFA for the regular expression. (0+1)*(0+1)10	**10**	**1**
c.	Eliminate the left recursion from the following grammar S →AB, A→ BS | b, B → SA | a	**10**	**2**

d.	Generate three address code for the following code:
	switch a + b
	{
	case 1: x = x + 1
	case 2: y = y + 2
	case 3 : z = z + 3
	default: c = c -1
	}
		10	**3**

e.	Explain non-recursive predictive parsing. Consider the following grammar and construct the predictive parsing. Table E→TE' E' → +TE'| ε T → FT' T' → *FT'| ε F → F*|a|b	**10**	**2**

SECTION-C

3. Attempt any one **part of the following:** **10x1 = 10**

Q.No	Question	Marks	CO
a.	How DAG is different from syntax tree? Construct the DAG for the following basic blocks. a := b + c b := b – d c := c + d e := b + c Also explain the key application of DAG	**10**	**2**
b.	Explain the various parameter passing mechanisms of a high level language.	**10**	**2**

4. Attempt any one **part of the following:** **1x10 = 10**

Q. No	Question	Marks	CO
a.	i) Check whether given grammar is ambiguous or not. If ambiguous then convert it into unambiguous grammar: E →E + E | E*E |id ii) Discuss about cross compiler	**5** **5**	**2** **1**
b.	Define syntax directed translation. Construct an annotated parse tree for the expression (4 * 7 + 1)*2, using the simple desk calculator grammar.	**10**	**3**

5. Attempt any one **part of the following:** **1x10 = 10**

Q.No	Question	Marks	CO
a.	Write short notes on: i) Global data flow analysis ii) Loop unrolling iii) Loop Jamming	**10**	**5**
b.	Distinguish between static scope and dynamic scope. Briefly explain access to non-local names in static scope.	**10**	**2**

6. Attempt any one part of the following

Q.No	Question	Marks	CO
a.	Write quadruple, triple and indirect triples for following expression: a = b * - c + b* - c	**10**	**3**
b.	Test whether the grammar is LL(1) or not, and construct parsing table for it. S → 1AB|ε A → 1AC|0C B → 0S C → 1	**10**	**2**

7. Attempt any one part of the following

Q.No	Question	Marks	CO
a.	Explain in detail the error recovery process in operator precedence parsing method.	**10**	**4**
b.	Explain what constitute a loop in flow graph and how will you do loop optimizations in code optimization of a compiler.	**10**	**5**