Hi-Tech Institute of Engineering & Technology

Department Of Computer Science

B.Tech. Subject Code: KCS502A

Model Paper 2

(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.	**Discuss the challenges in compiler design.**	**2**	**1**
b.	**Differentiate between compilers and Interpreters.**	**2**	**1**
c.	**What is the role of left recursion?**	**2**	**2**
d.	**State the problems associated with the top-down parsing.**	**2**	**2**
e.	What are the various types of intermediate code representation?	**2**	**3**
f	What is Syntax directed Definition (SDD)?	**2**	**3**
g	What are quadruples?	**2**	**3**
h	What is meant by activation record?	**2**	**4**
i	Consider the following grammar: S → B|SabS, B→bB|ε Compute Follow (B).	**2**	**2**
j	What are the various loops in flow graph?	**2**	**5**

SECTION-B

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

Q. No	Question	Marks	CO
a.	Explain in detail the process of compilation for the statement a = b + c*70.	**10**	**1**
b.	Write the quadruple, triple, indirect triple for the following expression (x+y)*(y+z)+(x+y+z).	**10**	**3**
c.	What is activation record? Explain how it is related with runtime–storage organization.	**10**	**4**
d.	Construct the NFA and DFA for the following regular expression. (0+1)*(00+11)(0+1)*	**10**	**1**
e.	Construct LR(0) parsing table for the following grammar S → cB| ccA A → cA|a B → ccB|b	**10**	**2**

SECTION-C

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

Q. No	Question	Marks	CO
a.	Consider the following sequence of three address codes: 1. Prod := 0 2. I:= 1	**10**	**5**

	3. T1:= 4*I 4. T2 := addr(A) – 4 5. T3:= T2[T1] 6. T4:= addr(B) – 4 7. T5:= T4[T1] 8. T6:=T3*T5 9. Prod := Prod + T6 10. I = I +1 11. If I<=20 goto (3) Perform loop optimization.		
b.	Write short notes on: i. Global data flow analysis ii. Loop unrolling iii. Loop jamming	**10**	**5**

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

Q. No	Question	Marks	CO
a.	Consider the following grammar S → AS|b A → SA|b Construct the SLR parse table for the grammar. Show the action of the parser for the input string "abab".	**10**	**2**
b.	How would you convert the following into intermediate code? Give a suitable example. i. Assignment statements ii. Case statements	**10**	**3**

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

Q. No	Question	Marks	CO
a.	Translate the following arithmetic expression into quadruples and triples: i. x= y*z + y* - z ii. a = -b *(c + d) +b	**10**	**3**
b.	How do we represent the scope information? Explain scope by number and scope by location.	**10**	**4**

6. Attempt any one part of the following

Q. No	Question	Marks	CO
a.	What is symbol table? Explain various data structures used for symbol table.	**10**	**3**
b.	Write down the translation procedure for control statement and switch statement.	**10**	**3**

7. Attempt any one part of the following

Q. No	Question	Marks	CO
a.	Explain in the DAG representation of the basic block with example.	**10**	**5**
b.	What are the various issues design of code generator and code loop optimization?	**10**	**5**