Subject Code: XXXXX

Roll No:

BTECH

(SEM-5) COMPILER DESIGN 2021-22

TIME:3 HOUR ***Total Marks: 100***

Instruction: Attempt the questions as per the given instructions. Assume missing data suitably.

SECTION - A

Attempt *All Parts* in Brief **2*10 = 20**

Q1	Questions	Marks
(a)	What is the difference between parse tree and abstract syntax tree ?	2
(b)	Explain the problems associated with top-down Parser.	2
(c)	What are the various errors that may appear in compilation process?	2
(d)	What are the two types of attributes that are associated with a grammar symbol?	2
(e)	Define the terms Language Translator and compiler.	2
(f)	What is hashing? Explain.	2
(g)	What is do you mean by left factoring the grammars ? Explain.	2
(h)	Define left recursion. Is the following grammar left recursive ? $E \rightarrow E + E \mid E*E \mid a \mid b$	2
(i)	What is an ambiguous grammar ? Give example.	2
(j)	List down the conflicts during shift-reduce parsing.	2

SECTION - B

Attempt *Any Three* of the following **3*10 = 30**

Q2	Questions	Marks
(a)	Construct the LALR parsing table for the given grammar S → BB B → aB/b	10
(b)	What is an activation record ? Explain how it is related with runtime -storage organization ?	10
(c)	Write the quadruple, triple, indirect triple for the following expression (x + y)*(y + 2) + (x + y + z)	10
(d)	Discuss the following terms: i. Basic block ii. Next use information iii. Flow graph	10
(e)	Construct predictive parse table for the following grammar. E → E + T/T T → T*F/F F → F /a/b	10

SECTION - C

Attempt *Any One* of the following **5*10 = 50**

Q3	Questions	Marks
(a)	Construct the SLR parse table for the following Grammar E' → E E → E + E E → E*E E → id	10
(b)	Differentiate between stack allocation and heap allocation.	10
Q4	**Questions**	**Marks**
(a)	Write syntax directed definition for a given assignment statement: S → id = E E → E + E E → E* E E → E E → (E) E → id	10

(b)	What are the advantages of DAG ? Explain the peephole optimization.	10
Q5	**Questions**	**Marks**
(a)	What do you understand by lexical phase error and syntactic error ? Also suggest methods for recovery of errors.	10
(b)	Discuss how induction variables can be detected and eliminated from the given intermediate code B2: i = i+1 t_1: = 4*j t_2: = a[t_1] if t_2 < 10 goto B2	10
Q6	**Questions**	**Marks**
(a)	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
(b)	Distinguish between statie scope and dynamic scope. Briefly explain access to non local names in static scope.	10
Q7	**Questions**	**Marks**
(a)	What are the various issues in design of code generator and code loop optimization ?	10

(b)	Generate the three address code for the following code fragment.
	while(a > b)
	{
	if(c< d)
	x = y + z;
	else
	x = y - z;
	}
		10