PAPER ID-411141

Subject Code: KIT052

Roll No: | | | | | | | | | | | | | |

B.TECH
(SEM V) THEORY EXAMINATION 2021-22
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* questions in brief. **2 x 10 = 20**

a. Explain the role of parser in compiler design.
b. What is meant by Dead code elimination?
c. What is LR(k) parsing?
d. Write Regular Expression for specifying Identifiers and Constants of C.
e. List the three kinds of intermediate representation.
f. Differentiate constant propagation and variable propagation.
g. Explain inherited translation.
h. Write the difference between syntax and semantic analysis.
i. Write three address code for the expression **a := 6*2+7.**
j . Define common sub expressions?

SECTION B

2. Attempt any *three* of the following: **10 x 3 = 30**

a. Construct the SLR parse table for the following Grammar.

S→AaAb
S→ BbBa
A→ ε
B→ ε

b. Differentiate between S- attribute SDT and L-attribute SDT with suitable example.
c. Write down techniques to recover errors from LR parser. Explain with an example
d. What is the pass of a compiler? Explain how the single and multi pass compiler work.
e. Generate three address code for the following code segment.

```
for (i=1;i<=10;i++)
    If (c<d) then x= y+z
```

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SECTION C

3. Attempt any *one* part of the following: 10 x 1 = 10

a. Draw a DAG for the expression:

a+a*(b-c)+(b-c)*d.

b. Construct the NFA and DFA for the following regular expression.

(a+b)* abb.

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

a. Discuss the following terms:

i. Loop jamming
ii. Loop unrolling
iii. Constant folding

b. Explain the following with example: i) Quadqaples ii) Triples iii) Indirect triple

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

a. Generate three address code for the following code segment. There are four bytes per word:

```
sum=0;
for(j=1;j<=20;i++)
sum = sum+ a[j]+ b[j];
```

b. How will you determine with the help of a parse tree, that the given grammar is ambiguous? Explain with example.

6. Attempt any *one* part of the following: 10 x 1 = 10

a. What is Symbol Table? Explain in detail about its contents and data structure.

b. Explain why Bottom up parsing is more generally applicable then Top down parsing.

7. Attempt any *one* part of the following: 10 x 1 = 10

a. What are the various storage management techniques available for symbol table? Explain these with the help of suitable programming example.

b. Construct the predictive parsing table for the following grammar:

S→A
A→aB / Ad
B→Bbc/f
C→g