B.E./B.Tech. DEGREE EXAMINATION, MAY 2021

Sixth Semester

Computer science and Engineering

15UCS601- PRINCIPLES OF COMPILER DESIGN

(Regulation 2015)

Duration: 1:45 hrs   Maximum: 50 Marks

PART A
(Answer any Ten Questions 10 x 2 Mark = 20 Marks)

1.	Compare Compiler and Interpreter.	(CO1-U)
2.	Illustrate the language processing system.	(CO1-U)
3.	What are the additional tasks done by the lexical analyzer besides lexical analysis?	(CO1-U)
4.	Draw the syntax tree of the statement a=a+b*(e/f)	(CO2-APP)
5.	Differentiate top down and bottom up parsing.	(CO2-U)
6.	When the grammar is said to be LL(1)?	(CO2-U)
7.	Draw the quadruple structure for the following statement x= -a*b+-a*b.	(CO3-APP)
8.	Generate three address code for the statement x=a*b+c/d-e.	(CO3-APP)
9.	What is back patching?	(CO3-U)
10.	What is common subexpression?	(CO4-U)
11.	What is peephole and what is the need of peephole optimization?	(CO4-U)
12.	Optimize the following loop	(CO4-APP)

```
        sum=0;
        i=1; a,b=5;c=8;
        while(i<=10) do
        {
        a=b+c;
        sum=sum+i*I;
        i++;
        }
```

13.	Define iteration spaces.	(CO5-U)
14.	Define temporal and spatial locality.	(CO5-U)
15.	What is a Diophantine Equation?	(CO5-U)

(Answer any Three Questions 3 X 10 = 30 Marks)

16. Illustrate the process of compilation for the program segment s= n*(n-1) with a neat sketch. | CO1 - APP | (10)

17. Design non-recursive predictive parser for the following grammar and parse the string id+id*id.

$$E\rightarrow E+T \;|T$$
$$T\rightarrow T*F \;|F$$
$$F \rightarrow(E) \;|id$$

CO2 - APP   (10)

18. Explain the translation of Boolean expressions in detail. | CO3 - U | (10)

19. Construct the DAG for the following basic block

    1. t1:=4*i
    2. t2:=a[t1]
    3. t3:=4*i
    4. t4:=b[t3]
    5. t5:=t2*t4
    6. t6:=prod+t5
    7. prod:=t6
    8. t7:=i+1
    9. i:=t7
    10. if i<=20 goto 1

CO4 - APP   (10)

20. Explain in detail about how synchronization can be done in parallelism | CO5 - U | (10)