Registration no: | | | | | | | | | | |

Total Number of Pages: 02 **M.TECH**
CSPE202

2nd Semester Back Examination – 2016-17
Compiler Construction

BRANCH: COMPUTER ENGG, COMPUTER SCIENCE, COMPUTER SCIENCE AND ENGG, COMPUTER SCIENCE AND TECH., INFORMATION TECH.

Time: 3 Hours
Max Marks: 70
Q.CODE: Z1168

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 **Answer the following questions:** **(2 x 10)**

a) Mention any two purposes behind identifying "reaching definitions".
b) What do you mean by spilling and spill code?
c) Compare access link and display.
d) What is the role of LEX and YACC?
e) What is meant by shot-circuit or jumping code?
f) Why are quadruples preferred over triples in an optimizing compiler?
g) Mention the purpose of register and address descriptors.
h) How an inherited attribute differs from a synthesized attribute.
i) What are various data structures used in a symbol table?
j) Define handle. What do you mean by handle pruning?

Q2 **a)** Show the output of each phase of the compiler for the following fragment of c code and explain briefly. **(5)**

```
float i, j;
i = i*70+j+2;
```

b) What is meant by input buffering? Explain the use of sentinels in recognizing tokens. **(5)**

Q3 **a)** Consider the following grammar **(5)**

$$E \rightarrow E+T \mid T$$
$$T \rightarrow TF \mid F$$
$$F \rightarrow F^* \mid a \mid b$$

Construct the SLR parsing table for this grammar. Also parse the input a*b+a.

b) Construct the transition diagram to recognize the tokens for identifiers and relational operators. **(5)**

Q4 **a)** Eliminate Left Recursion from the following grammar **(5)**

$$S \rightarrow a \mid \uparrow \mid (T)$$
$$T \rightarrow T , S \mid S$$

Draw the predictive parse table. Is the parser LL(1)?
Show the actions of the parser for the input string (a,a).

b) What do you mean by activation record? Explain handlings of activation records for calling sequences. **(5)**

Q5 **a)** Explain the error recovery in LR parsing with a suitable example. **(5)**

b) What is DAG? Write an algorithm to construct DAG from the block of three address code. Construct the DAG for the following basic block : **(5)**

```
o=l * n
p=m + l
l=l * n
m=p - o
```

Q6 **a)** What is inherited attribute? Write the syntax-directed definition with inherited attributes for type declaration for list of identifiers. Show the annotated parse tree for the sentence real ***id1, id2, id3.*** **(5)**

b) Generate the tree-address code for the following program fragment. **(5)**

```
while(A<C and B>D) do
  if A=1 then C=C+1
else
        while A<=D do
A=A+3
```

Q7 **a)** Discuss in detail the allocation of registers during code generation. **(5)**

b) Explain different type of optimization that can be performed in a loop. **(5)**

Q8 **Write short notes any of two** **(5 x 2)**

a) Peephole optimization

b) compilation for high performance architecture

c) Operator Precedence Parsing

d) procedural and inter- procedural optimization