(Please write your Exam Roll No.) *Exam Roll No. .....*

END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] MAY- JUNE 2017

Paper Code: ETCS-302 ***Subject: Compiler Design***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt any five questions including Q.No1 which is compulsory. Select one question from each unit.

Q1 Attempt **any five** parts:- **(5x5=25)**

(a) Explain the process of Bootstrapping in complier design with example.
(b) Differentiate between SDD and SDT with example.
(c) What is left recursion and left factoring? Explain each with example.
(d) What is back patching? Explain with example.
(e) What is the process of identifying basic blocks in code optimization phase?
(f) Differentiate between top-down and bottom-up parsers with example.
(g) Write a SDT for converting infix expression to post fix expression by taking suitable example.

UNIT-I

Q2 (a) For the grammar given below:- **(7.5)**

E→TE'
E'→+TE'| ε
T→FT'
T'→*FT'|ε
F→(E)|ID

Construct the LL(1) parsing table.

(b) Check whether the following grammar is LL(1) or not **(5)**

i. S→A|a, A→a
ii. S→aSA|ε, A→c|ε

Q3 (a) What do you mean by Handle? Check whether the grammar **(5)**
E→E+T|T,T→a is LR(0) or not

(b) Construct a LR (1) parsing table for **(7.5)**
S→Aa|bAc|dc|bda
A→d

UNIT-II

Q4 (a) Write an SDT to count the number of binary digits in a binary number. (Hint:1011 count is 4) **(5)**

(b) Differentiate between S-attributed and L-attributed SDT's. Write the steps to create the SDT for any problem and write SDT for converting any number from binary to decimal. **(7.5)**

Q5 (a) What do you mean by three address code? Explain how the three address code is represented vis quadruples, triples and Indirect triples with examples. **(7.5)**

(b) Write the three address code for: **(5)**
(i) while(a<5)do a:b+2)
(ii) –a(a+b)*(c+d)+(a+b+c)

UNIT-III

Q6 (a) What do you mean by symbol table? Write an example that shows how different phases of complier interact with symbol table. **(6)**

(b) How the data is stored in symbol table for block and non-block structured languages? **(6.5)**

Q7 (a) What are different types of errors that occurs during, lexical, syntactic and semantic phase. **(6)**

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(b) What are the different storage allocation strategies in the runtime environment of the complier? (6.5)

UNIT-IV

Q8 (a) What do you mean by the term code optimization? What do you understand by the term leader? Write algorithm to identify out the basic Blocks. (6)

(b) Identify the basic blocks in the following code and draw the DAG graph for the same: (6.5)

```
main()
{
    inti=0,n=10;
    int a[n];
    while(i<=(n-1))
{
    A[i]=i*i;
    i=i+1;
}
    return;
}
```

Q9 (a) What do you mean by peephole optimization? Explain with example. (6)

(b) What are the issues that occurs during the code generation process? (6.5)

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