Compiler Construction

First Sessional Exam, Fall 2016

Date: Sep 21, 2016 **Marks:** 40 **Time:** 60 min

Solve question 1 on page 1, question 2 on page 2, and so on.

Question 1 (5+5 marks)

a) Give a regular definition for date constants, where each constant has a two-digit day, a three-lettered month, and a four-digit year. Following are few examples:

25 Feb 1875 03 Sep 1980 17 Jun 2016

You do not need to check for the days. For example, 35 Feb 1975 is incorrect, but you do not need to worry about such deeper issues.

b) Give a transition diagram for time constants, where each constant has two-digit hours, minutes and seconds, separated by colons. Following are few examples:

09:10:20 15:30:40 22:50:55

Question 2 (5+5 marks)

a) Set operator precedence in the following CFG as follows: "not" shall have highest, then comes "and", and the "or" shall have lowest precedence.

```
BE -> BE and BE | BE or BE | not ( BE ) | true | false
```

b) Set the associativity of the "and" and "or" operators from right to left (right associative). Use the original grammar, given above.

Question 3 (5+5 marks)

a) Remove any left recursion from the following grammar:

```
L -> L , id | L : num | # | *
```

b) Left factor the following grammar:

```
D -> VD | FD
VD -> T id ;
FD -> T id (OPL) { L }
OPL -> PL | ^
PL -> PL , T id | T id
```

Question 4 (10 marks)

Give any two important advantages of each of the following three language processors: Compilers, Interpreters, and Hybrid systems. Write only one or two lines for each advantage.