	Course Name:	Compiler Construction	Course Code:	CS-402
	Program:	BS (CS)	Semester:	Fall 2018
	Duration:	60 Minutes	Total Marks:	30
	Paper Date:	2-Oct-2018	Weight	
	Section:	ALL	Page(s):	3
	Exam Type:	Midterm-I		

Student : Name:_____ Roll No._____ Section:_____

Instruction/Notes: Solve all questions on this question paper. Do not attach any other answer sheet.

Question 1 (5+5 marks)

a) Fill in the blanks, using the following words: compiler, interpreter or hybrid system.

i. _____ provides the fastest execution

ii. _____ does not hide source code

iii. _____ provides platform independence while protecting source code

iv. _____ is not good for debugging

v. _____ uses both a compiler and an interpreter

b) Mark the following sentences as true or false:

i. Lexical analyzer can determine the type of a variable

ii. Parser can check a function call for correct number of parameters

iii. Semantic analyzer performs type checking

iv. Intermediate code generator may generate three-address code

v. Short-circuit evaluation is an error

Question 2 (5+5 marks)

a) Give output of a lexical analyzer for the following program:

```
int swap(int & x, int & y) {
   int tmp = x;
   x = y;
   y = tmp;
}
```

b) Consider a programming language that allows programmer to write time-literal as follows:

```
Time lunchTime = 01:30:00 pm;
```

Here a new variable "`lunchTime`" of Time type is declared and initialized. Your task is to give a regular definition for all valid time literals.

Question 3 (5+5 marks)

a) Consider the following grammar:

```
BE -> BE and BF | BE or BF | ( BE ) | BF
BF -> true | false
```

Rewrite the above CFG to set precedence of the logical operators. The precedence of "and" is higher than "or", while the precedence of parenthesis is highest.

b) Left factor the following grammar:

```
S -> id = E | single | compound
single -> while ( E ) S
compound -> while ( E ) { S }
```