JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

MAKEUP EXAMINATION- 2016

B.Tech VIth Semester

COURSE CODE: 10B11CI612 : MAX. MARKS: 25

COURSE NAME: Compiler Design

COURSE CREDITS: 04 MAX. TIME: 1Hr 30 Min

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

1. a. Show the complete process followed by a compiler for compiling a given source code in the form of a flowchart.
   b. State the difference between the *shift-shift* and *shift-reduce* conflicts.
   c. Why do we require a symbol table?
   d. Show that the following grammar is ambiguous? Justify why/why not with the support of proper parse tree(s).

   S → aSbS | bSaS | ε   [1+1+1+2 = 5 Marks]

2. a. Compute FIRST(X) and FOLLOW(X) for all non-terminals X of the following grammar.

   A → AX | Y   X → Ab | c   Y → d | e

   b. Perform shift reduce parsing on the following grammar by handle pruning at each stage for the string *ibtibtaea*:

   S → iEtS | iEtSeS | a   E → b   [2.5+2.5 = 5 Marks]

3. Construct an LL(1) top down parsing table for the following grammar and parse the input string *qbbcb#*

   S′ → S#
   S → qABC
   A → a | bbD
   B → a | ε
   C → b | ε
   D → c | ε   [5 Marks]

4. Construct the LALR parsing table for the following grammar and parse the string *a=(b)*

   Stmt ->Cond_expr EQTO Cond_expr
   Cond_expr -> (Cond_expr)
   Cond_expr ->Pri_expr
   Pri_expr -> ID
   Pri_expr -> CONSTANT   [5 Marks]

5. Write the semantic rules to build a parse tree for the following grammar

   X → X + Y | Y   Y → Y * Z | Z   Z → (X) | *identifier*   [5 Marks]