

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

(T-1 Examination Feb-2018)

B.Tech. 6TH Semester

COURSE CODE: 10B11CI612

MAX. MARKS: 15

COURSE NAME: COMPILER DESIGN

COURSE CREDITS: 4

MAX. TIME: 1 Hrs

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

- Q.1 Find the number of tokens in the below mentioned code. (3)
- ```
class Main extends Foo {
 Main() {
 int x;
 x = fact(5);
 }
 int fact(int n) {
 if (n==0)
 return 1;
 else return n * fact(n-1);
 } /* ***** / *another comment*/
};
```
- Q.2 Consider the following CFG grammar,  
 $S \rightarrow aABe$   
 $A \rightarrow Abc \mid b$   
 $B \rightarrow d$   
 where a, b, c and d are terminals, and S (start symbol), A and B are non terminals.  
 For the above example answer the following questions:
- a) Parse the sentence "abbcd" using right-most derivations. (1)  
 b) Parse the sentence "abbcd" using left-most derivations. (1)  
 c) Draw the parse tree. (1)
- Q.3 Construct a table-based LL(1) predictive parser for the following grammar  
 $G = \{ \text{bexpr}, \{ \text{bexpr}, \text{bterm}, \text{bfactor} \}, \{ \text{not}, \text{or}, \text{and}, (, ), \text{true}, \text{false} \}, P \}$  with P given below.
- ```
bexpr → bexpr or bterm | bterm
bterm → bterm and bfactor | bfactor
bfactor → not bfactor | ( bexpr ) | true | false
```
- For this grammar answer the following questions:
- (a) Remove left recursion from G. (2)
 (b) Left factor the resulting grammar in (a). (1)
 (c) Compute the FIRST and FOLLOW sets for the non-terminals. (2)
 (d) Construct the LL parsing table. (2)
- Q.4 Solve the following statement (2)
- ```
position = initial + rate * 60
```
- using the different phases of compilation process.