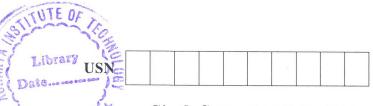
BANGAL



Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020 Compiler Design

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO full questions from each part.

PART - A

- a. Discuss the various phases of a compiler, show the translation for an assignment statement position = initial + rate * 60 clearly indicate the output of each phase. (12 Marks)
 - b. Write regular definition for an unsigned number, also draw transition diagrams for the same.

 (06 Marks)
 - c. Write a brief note on science involved in building a compiler.

(02 Marks)

- 2 a. Define the terms: i) Left recursion; ii) Left factorization, and refine the following grammer.
 - i) $S \rightarrow Aab$

 $A \rightarrow Ac |Sd| \in$

ii) st \rightarrow identifier := explidentifier (exp-list) other.

(06 Marks)

b. Given the grammer

 $S \to a \uparrow (M)$

 $M \rightarrow M, SS$

i) Make necessary changes, suitable for LL(1) parsing

(02 Marks)

ii) Construct predictive parsing table

(08 Marks)

iii) Show the parser moves on the input (a, (a, a)).

(04 Marks)

3 a. What is shift reduce parsing, list the actions of SR parser for the grammer given below,

 $S \rightarrow (S)S \in$ and the input is () \$. What are the 2 conflicts that may occur during shift reduce parsing?

b. Obtain a set of canonical LR(0) items for the grammer and construct LR(1) parsing table. Is the grammer SLR(1). Give reasons.

Grammer is $S \rightarrow L = R$

$$S \rightarrow R$$

$$L \rightarrow * R$$

$$L \rightarrow id$$

$$R \rightarrow L$$

(12 Marks)

4 Consider the following grammer

$$S \rightarrow AA$$

$$A \rightarrow aA \mid b$$

a. Determine if the grammer is LR(1) or not.

(10 Marks)

b. Determine if the grammer is LALR or not.

(10 Marks)

PART - B

- 5 a. Give the syntax directed definition to process a simple variable declaration in 'C'. (06 Marks)
 - b. Define dependency graph and construct dependency graph for the input float id1, id2, id3.

 (08 Marks)
 - c. Define inherited and synthesized attributes, give examples for each.
- 6 a. Write syntax directed definition for flow of control statements
 - i) $S \rightarrow if(B) S1$
 - ii) $S \rightarrow \text{while (B) } S1$

(06 Marks)

(06 Marks)

- b. Explain the following with an example:
 - i) Quadraples
 - ii) Triples
 - iii) Indirect triples.

(09 Marks)

Translate the given, assignment statement into three-address-code, n = f (a[i]);

(05 Marks)

- 7 a. What is an activation record? Explain the purpose of each item in the activation record with example. (10 Marks)
 - b. Explain desirable properties of memory manager.

(05 Marks)

- c. Explain briefly the performance metrics to be considered while designing a garbage collector. (05 Marks)
- 8 a. Discuss the various issues in the design of a code generator.

(10 Marks)

b. Write the three-address code and construct the basic blocks, for the following program segment:

Sum = 0;

for (i = 0; i < = 10; i++)

sum = sum + aLi;

(10 Marks)