B.E.-Information Technology Sem VIII

IT801 - Compiler Design

P. Pages : 2 **GUG/S/18/7091**

Time : Three Hours *2192* Max. Marks : 80

Notes :
1. Same Answer book must be used for All questions.
2. All questions carry marks as indicated.
3. Due credit will be given to neatness and adequate dimensions.
4. Assume suitable data wherever necessary.
5. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Describe the errors encountered in different phases of compiler. **8**

b) Define compiler? State various phases of compiler and describe in detail. **8**

OR

2. a) Explain four software tools that are used in compiler construction. **8**

b) Translate the following expression into various phases of compiler. **8**
$a := b * c / a + d$

3. a) Describe the concept of Predictive parsing and shift reduce parsing. **8**

b) Explain the role of parser in detail. Explain error recovery methods of LR parsers. **8**

OR

4. a) Prepare the following grammar is LL(1) or not and construct predictive parsing table. **8**
$S \to aB \mid aC \mid Sd \mid Se$

$B \to bBc \mid f$

$C \to g$

b) Analyze the following grammar is a LR(1) grammar and construct LALR parsing table **8**
$S \to Aa \mid bAc \mid dC \mid bda$

$A \to d$

$C \to a$

5. a) Explain detail specifications of type checker. **8**

b) Determine the value of arithmetic expression for the following grammar. Give the translation scheme and draw the annotated tree **8**
$E \to E + T \mid E - T \mid T$

$T \to (E) \mid digit$

OR

6. Give grammar construct SDD and generate code fragment using s-attributed defination. Also evaluate the string $"(4+(8*5));"$ with parser stack using LR parsing method. **16**

7. a) Generate three-address code for the following statement – **11**

```
begin
for   i = 1 to n do
for   j = 1 to n do
      c [i, j] = 0;
for   i = 1 to n do
for   j = 1 to n do
for   k = 1 to n do
c[i, j] = c [i / j] + a [i, k] * b [k, j]
end
```

b) Write short note on polish notation. **5**

OR

8. Following are grammer increment and decrement operators + + and – – **16**

$E \to E + E \mid ++E \mid -E \mid E++ \mid E-- \mid id = E$

give semantic actions to generate an intermediate code.

9. a) Describe the concepts of basic blocks and flow graphs. **8**

b) Prepare the total cost by using DAG of the following basic blocks **8**

$$X * \left[y * z + \frac{H}{((I-J)*k)} \right]$$

OR

10. a) Evaluate the minimum cost instruction sequence for a statement **8**

$a = b + c * d + e - 34$

b) Generalize the process of optimization of basic blocks. Give an example. **8**

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