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B.E. (Computer Science & Engineering) Seventh Semester (C.B.S.)

Language Processor

P. Pages : 2 **NRT/KS/19/3572**

Time : Three Hours * 0 2 5 7 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.

1. a) What do you mean by phase & pass of a complier? Explain lexical analysis phase of a compiler in detail. **7**

b) What are compiler writing tools? Explain each in detail. **6**

2. a) Explain various phases of a compiler in detail for the given expression $a = b * c + d / e$ give output for each phase of compiler including symbol table and memory representation. **8**

b) Explain & write LEX program that recognizes: **5**
i) Keyword if, while, far ii) Identifier
iii) Operator $+ | - | * | 1$

3. a) Generate CLR table for following grammar. State whether grammar is CLR or not. **10**

$B \rightarrow bDAe$

$D \rightarrow Dd; | E$

$A \rightarrow A; E | E$

$E \rightarrow B | a$

b) What is an ambiguous and unambiguous grammar. **4**

4. a) Construct LL(1) parser for following grammar. Show moves made by this LL(1) parser on input "$id + id * id$" **8**

$E \rightarrow E + T | T$

$T \rightarrow T * F | F$

$F \rightarrow (E) | id$

b) Compare SLR, CLR and LALR parser. **6**

5. a) Write SDTS & obtain three address code for the following statement. **9**

if $(p > q$ and $r <= s)$

then

$\mu = \mu * v ;$

else

$\mu = \mu / v ;$

Draw annotated parse tree.

b) Define : **4**
i) Inherited attribute
ii) Synthesized attribute

6. Translate following code into intermediate code **13**
A[i, j, k] = B[i, j] + C[i + j + k]
where A is 3D array of size $10 * 10 * 10$
B is 2D array of size $10 * 10$
C is 1D array of size 30 bytes per word = 2
Draw annotated parse tree for the same.

7. a) What are syntactic & semantic errors of suggest method to recover from these errors. **6**

b) Explain phrase level error recovery method for LR parser. **7**

8. a) Explain different data structure used for symbol table. Also compare pros & cons of each. **6**

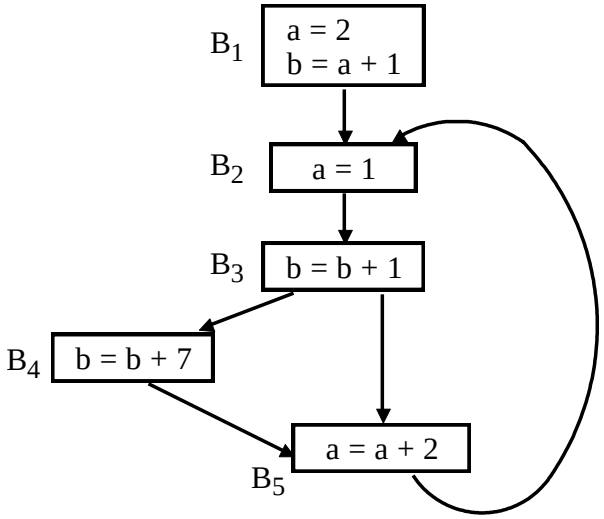
b) What is an activation record ? When this record need to be an set up? Explain meaning. **7**

9. a) Explain loop unrolling & jamming with suitable example. **6**

b) What is reducable flow graph ? Explain with example. **4**

c) Write short note on DAG. **4**

10. Consider following flow graph. Compute IN & OUT for flow graph. **14**



11. Generate code for following expression using labeling algorithm **13**
$x = (a + b) - (e - (c + d))$

12. a) What are the problems in the way of good code generation. **6**

b) Explain peephole optimization techniques in detain. **7**

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The secret of getting ahead is getting started.

~ Mark Twain