Total No. of Questions : 5]

SEAT No. :

PE-1524

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T.Y. B.Sc. (Computer Science)
CS-366 : COMPILER CONSTRUCTION
(Revised 2019 Pattern) (CBCS) (Semester - VI)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Neat diagram must be drawn wherever necessary.***

Q1) Attempt any Eight of the following. (Out of 10) **[8 × 1 = 8]**

a) List all the phases of compiler?

b) Which one is the most powerful parser in Bottom up parsing?

c) What is handle pruning?

d) Define Lexical Analyzer.

e) Define the term basic block?

f) Define Boatstropping?

g) Find the taken for area = 3.14 * r * r ?

h) State true or false. Bottom up passing uses the process of derivation.

i) Name the conflict which is not possible in LR passes.

j) Define SDD (Syntax directed defination)

Q2) Attempt any 4 (four) of the following (Out of 5) **[4 × 2 = 8]**

a) Eliminate Left Recursion from the below grammar.

$E \rightarrow E + T \mid T$

$T \rightarrow T * F \mid F$

$F \rightarrow (E) \mid id$

b) Difference between synthesized & Inherited attribute?

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c) Compute LEADING & TRAILING Symbol

$S \rightarrow (T) \mid a \mid \wedge$

$T \rightarrow T, S$

d) Explain any two code optimization technique.

e) Construct Quadruples for the following

$(a + b) * (m - n) \uparrow (m + n)$

Q3) Attempt any two of the following. (Out of 3) **[2 × 4 = 8]**

a) Write a Recursive Descent Parsers (RDP) for the following Parsers :

$G = (\{A\}, \{\theta, 1\}, P, A)$

$P : A \rightarrow O\ A\ O \mid A\ 1 \mid A\ A \mid 1$

b) Check whether the given grammar is CLR(1) or not?

$S \rightarrow AA$

$A \rightarrow aA \mid b$

c) Check whether the following grammar is LL(1) or not?

$S \rightarrow S\# \mid aA \mid b \mid cB \mid d$

$A \rightarrow aA \mid b$

$B \rightarrow cB \mid d$

Q4) Attempt any TWO of the following. (Out of 3) **[2 × 4 = 8]**

a) Check whether the following grammar is SLR (1) or not

$S \rightarrow A \mid B$

$A \rightarrow aA \mid b$

$B \rightarrow dB \mid b$

b) Check whether the following grammar is operator precedence or not?

$E \rightarrow E + E \mid E * E \mid (E) \mid id$

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c) Consider the following SDD & construct Annotated Parse tree for the input string 4 + 5 + 3.

Production	Semantic Rule
$E \rightarrow TE'$	$E'\bullet inh = T\bullet val$ $E\bullet val = E'\bullet syn$
$E' \rightarrow + TE'$	$E_1'\bullet inh = E'\bullet inh + T\bullet val$ $E'\bullet syn = E_1'\bullet syn$
$E' \rightarrow \in$	$E_1'\bullet syn = E_1'\bullet inh$
$T \rightarrow digit$	$T\bullet val = digit\bullet Lexval$

Q5) Attempt any one of the following (out of 2) **[1 × 3 = 3]**

a) Write a LEX program to count the vowels from given string?

b) Construct DAG for the following

i) (a + (a * (b – c)) + ((b – c) * d))

ii) $y + (y + x) / (x - z) * (x - z)$

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