08/7/23

Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058-India
(Autonomous College Affiliated to University of Mumbai)

Re-exam

End Semester Examination
May 2023

Max. Marks: 100 **Duration: 180 min.** **Class: T.E.**

Semester: VI **Course Code: CS 306** **Branch: COMP**

Name of the Course: Compiler Construction

Instructions:
(1) **All Questions are Compulsory**
(2) **Draw neat diagrams**
(3) **Assume suitable data if necessary**

Q. No	Question	Max Marks	CO
Q1	apply optimization of DFA on the regular expression given below ba(a|b)*ab	15	CO1
Q2 A	Show that the following grammar is LR(1) by constructing a state diagram(closure) and draw a parsing table. S → Aa | bAc | BC | bBa A → d B → d	10	CO2
Q2 B	The following Grammar generates binary numbers L → LB | B B → 0 | 1 1. Draw the parse tree for the string 101. 2. Design an S-attributed SDD to compute S.val , the decimal-number value of an input string. For example the translation of string 101 should be 5 .	10	CO2
Q3 A	for the boolean expression, **A < B OR C < D AND P < Q** using the translation scheme for backpatching of Boolean expression, 1. draw an annotated parse tree with the true and false lists for each subexpression. 2. Also generate the 3AC , assuming that the address of the first instruction generated is 100.	10	CO3

P.T.O

Q3 B	For a language of arithmetic expressions that can be generated by given grammar E-> E+E | E*E | id i. construct a operator precedence matrix ii. Construct operator precedence function values f() and g() **OR**	10	CO2
Q 3 B	Consider the grammar $S \rightarrow (L) \mid a$ $L \rightarrow L , S \mid S$ with reference to above grammar and precedence relation matrix given below , parse the statement using operator precedence parser. **show stack , input buffer and action after each step. also comment if it is accepted or rejected** (a , (a , a)) a: $\cdot>$ $\cdot>$ $\cdot>$ (: $<\cdot$ $<\cdot$ $\doteq$ $<\cdot$): $\cdot>$ $\cdot>$ $\cdot>$,: $<\cdot$ $<\cdot$ $\cdot>$ $\cdot>$ $: $<\cdot$ $<\cdot$	10	
Q4 A	With reference to SIC Macro processor explain conditional macro expansion ? also explain the following directives related with it along with example 1. IF ELSE END IF 2, SET	10	CO5
Q4 B	Draw And explain block schematic of 2 pass SIC assembler. Explain various data structures used in it with an example ?	10	CO5

Q5 A	Consider the basic block given below $t_1 = a + b$ $t_2 = c * d$ $t_3 = t_1 - t_2$ $t_4 = e / f$ $t_5 = t_3 * e$ $t_6 = t_5 * f$ $t_7 = t_1 * t_4$ $t_8 = t_7 + t_6$ Construct DAG. Apply heuristic ordering (optimal) to it. Apply code generation algorithm to generate the code.	15	CO4
Q5 B	Draw and explain structure of general activation records and its usage with reference to run time environment	10	CO4