Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058, India

(Autonomous College Affiliated to University of Mumbai)

Re Examination Synoptic

January 2020

Max. Marks: 60 Duration: 3 Hrs.
Class: TE Semester:VI
Course Code: CE61 Branch: Computer
Name of the Course: System Programming and Compiler Construction

Q. No.		Max. Marks
Q.1 A	Draw and explain analysis and synthesis model of a compiler. Analysis phase - 3 marks- 1 mark for each phase (Lexical, syntax and semantic analysis) Synthesis phase - 3 marks- 1 mark for each phase (Intermediate Code Generation, Code Optimisation and Code Generation)	6
Q.1 B	Define assembler directives. - 1 marks Explain with example following assembler directives used in SIC. a) START 1 mark b) BYTE 1 mark c) WORD 1 mark d) RESB 1 mark e) RESW 1 mark	6
Q.2 A	Check whether the below given grammar is LL(1) or not by constructing LL(1) parsing table. $X \rightarrow (Y)\|num$ $Y \rightarrow YXZ\|y$ $Z \rightarrow +XZ\|\epsilon$ where X, Y and Z are non terminals, X is a start symbol and (,), num, y and + are terminals. 1 mark for checking and eliminating(if exists) left recursion 1 mark for checking and left factoring(if exists) 5 marks for parsing table 1 mark for stating whether the grammar is LL(1) or not. **OR** Construct LR(0) parsing table for the below given grammar which expresses naming conventions of identifiers $I \rightarrow LD$ $D \rightarrow LD\|DL\|d\|\epsilon$ $L \rightarrow c\|\epsilon$ where I, D, L are non-terminals, I is a start symbol, d, c are terminals. Also draw DFA of LR(0) items. 4 marks for DFA and 4 marks for correct parsing table.	8
Q.2 B	Describe with the help of a small program, the structure of a lex program. Example- 1 mark Description of each section carries- 1 mark - so total 3 marks	4

Q.3 A	Explain data structures involved in SIC/XE macroprocessor. 2 marks for each data structure NAMTAB - 2 marks DEFTAB- 2 marks ARGTAB- 2 marks **OR** Explain how unique labels are generated during macro expansions. 3 marks for explanation and 3 marks for example	6
Q.3 B	Generate quadruples and triples for the statement $a = b * -c + b * -c$ where $-$ is the unary operator. 3 marks for triple representation and 3 marks for quadruple representation	6
Q.4 A	What is a linker? What are the basic loader functions? Explain them in short. 1 mark for linker definition 1 mark for each of the following functions Loading, Linking and Relocation	4
Q.4 B	Explain with example synthesized and inherited attributes used in Syntax Directed Definition. 4 marks for Synthesized attributes example along with the explanation 4 marks for inherited attributes example along with the explanation	8
Q.5 A	Explain heap storage allocation. Proper explanation with the required diagram - 8 marks will be given **OR** Explain stack storage allocation. Proper explanation with the required diagram - 8 marks will be given	8
Q.5 B	Explain following methods of code optimisation: i) Common-sub expression elimination 1 mark for explanation and 1 mark for example ii) Copy propagation - 1 mark for explanation and 1 mark for example	4