Bharatiya Vidya Bhavan's

SARDAR PATEL INSTITUTE OF TECHNOLOGY

(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.

Re-Examination

August 2021

Max. Marks: 60 **Duration: 2 Hrs.**
Class: T.E **Semester: VI**
Course Code: CE61 **Branch: Computer Engineering**
Name of the Course: System Programming and Compiler Construction

Instruction:

1) **All questions are compulsory.**
2) **Draw neat diagrams.**
3) **Assume suitable data if necessary but justify the same.**

Q. No.	Question	Max. Marks	COs
Q. 1 (a)	Given below is a program PROG that has been written using the SIC/XE machine. i) Write the mathematical expressions equivalent to the above program code ii) Assuming that it is to be loaded in memory from 0058H, generate the corresponding addresses for each instruction and write the corresponding machine code. The operation codes for the instructions are LDT=74, LDA=00, ADDR=90, SUB=1C, STA=0C and the addresses for registers A and T are 0 and 5 respectively.	08	CO2
Q. 1 (b)	Exemplify the various data structures involved in SIC/XE macro processor with a small sample of code.	07	CO2
Q. 2 (a)	Prove that the given grammar is LL(1) grammar S → aBDh B → cC C → bc/Є D → EF E → g/Є F → f/Є	08	CO3

	LDT	NUM
	LDA	ALPHA
	ADDR	T, A
	SUB	#8
	STA	SUM1
	LDA	GAMMA
	ADDR	T, A
	SUB	#12
	STA	SUM2
ALPHA	RESW	1
SUM1	RESW	1
GAMMA	RESW	1
SUM2	RESW	1
NUM	RESW	1

Q. 2 (b)	Construct CLR Parsing table for the grammar S → L=R/R L→ *R/id R→ L. OR Test whether the grammar is LL (1) or not and construct a predictive parsing table for following grammar. S→ iEtSA | a, A → eS | ε, E → b	07	CO3
Q. 3 (a)	What are the common conflicts that can be encountered in shift reduce parsers? Explain.	08	CO3
Q. 3 (b)	Write the translation scheme to generate intermediate code for assignment statements with array references.	07	CO4
Q. 4 (a)	Translate the given expression into Quadruples, triples, and indirect triples. (i+j)*(k+l)+(i*j/k)*j+60 OR What is a leader of basic block? Write and explain the algorithm used to find leaders. Draw flow graph for matrix multiplication.	08	CO4
Q. 4 (b)	What is the significance of symbol table at runtime and compile time? Discuss it in detail.	07	CO5