K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

May-June 2025
(B. Tech) Program: Computer Engineering Scheme IIB
Regular Examination: TY Semester: VI
Course Code: CEC601 and Course Name: System Programming and Compiler Construction
Date of Exam: 20/05/2025 Duration: 2.5 Hours Max. Marks: 60

Instructions:
(1)All questions are compulsory.
(2)Draw neat diagrams wherever applicable.
(3)Assume suitable data, if necessary.

Q. No.	Question	Max. Marks	CO	BT level
Q 1	Solve any **two** questions out of three: (05 marks each)	10		
a)	Enlist different system software. Differentiate between system software and application software.		CO1	U
b)	Enlist and explain data structures involved in the design of Macroprocessor.		CO3	U
c)	How the forward reference problem is handled in two pass assembler.		CO2	U
Q 2	Solve any **two** questions out of three: (05 marks each)	10		
a)	Describe relocating loader and direct linking loader.		CO4	U
b)	Explain Triple and Quadruple with respect to TAC. Show the triple and Quadruple for the following statement. a:= b + c * d		CO6	Ap
c)	Explain with example conditional macro expansion.		CO3	U
Q.3	Solve any **two** questions out of three. (10 marks each)	20		
a)	What are the phases of the compiler? Give working of each phase for following statements: Int a,b,c=1; A=a*b-5*3 / c		CO5	Ap
b)	Explain code optimization techniques.		CO6	U
c)	Consider the following grammar S -> (L) | a L -> SL' L' ->)SL' | ε Is the above grammar LL(1)? Justify your answer.Also, mention the steps involved in deriving the parsing table.		CO5	Ap

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Q.4	Solve any **two** questions out of three. (10 marks each)	20		
a)	Design and explain Shift Reduce parser for string (a+b)*(b+c) w.r.t. given grammar. Design the parse tree. E-> E+E | E*E | (E) | a|b|c		CO5	Ap
b)	With reference to assembler design explain the following table with a suitable example. i. MOT ii. POT iii. ST iv. BT		CO2	U
c)	Explain the different issues in code generators.		CO6	U

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