1715122

(B.Tech/M.Tech.) Program: **Computer Engineering**

Examination: **TY**   Semester: **VI**

Course Code: **1UCEC601** Course Name: **System Programming and Compiler Construction**

Duration: **03 Hours**

Max. Marks: **60**

Instructions:

(1) All questions are compulsory.

(2) Draw neat diagrams wherever applicable.

(3) Assume suitable data, if necessary.

		Max. Marks	CO	BT level
Q 1	**Solve any six questions out of eight:**	12		
i)	Arrange the following System Softwares according to their role in Program Execution: Linker, Loader, Compiler, Macro-preprocessor, Assembler, Text Editor	2M	CO1	Ap
ii)	Enlist the data structures involved in the design of a Two Pass Assembler.	2M	CO2	R
iii)	Define a Macro with an example	2M	CO3	U
iv)	Enlist the functions of Loader	2M	CO4	R
v)	Define a Lexeme, Token and Pattern with an example	2M	CO5	U

vi)	Enlist the Bottom Up Parsing techniques	2M	CO5	R
vii)	What is the significance of the Code Optimization Phase in the process of Compilation?	2M	CO6	U
viii)	Enlist the different Intermediate Code Representations	2M	CO6	R
Q.2	**Solve any four questions out of six.**	16M		
i)	Differentiate between System Software & Application Software	4M	CO1	U
ii)	Explain how the Two Pass Assembler resolves Forward referencing problems.	4M	CO2	U
iii)	Explain Nested Macro Call with an example	4M	CO3	U
iv)	Describe absolute loader and compile and go loader	4M	CO4	U
v)	Deduce the FIRST and FOLLOW of the non-terminals in the following Grammar : $S \to aBDh$ $B \to cC$ $C \to bC \, / \, \epsilon$ $D \to g$	4M	CO5	Ap
vi)	Generate the assembly language code for the following Arithmetic Expression : $a = b - (c * d)$ based on code generation algorithm. Also depict the updations in Register descriptors and address descriptors	4M	CO6	Ap
Q.3	**Solve any two questions out of three.**	16M		
i)	Explain the working of pass 1 macroprocessor with flowchart.	8M	CO3	U
ii)	Construct the Predictive Parsing(LL) table for the given grammar. Also, mention the steps involved in deriving the Parsing Table. $E \to E + T \mid T$ $T \to T * F \mid F$ $F \to (E) \mid id$	8M	CO5	Ap
iii)	Deduce the Operator Precedence Parsing Table for the given grammar. Also, perform the parsing action over the given input string	8M	CO5	Ap

	Grammar : E → E + E | E x E | id Input string : id + id * id			
Q.4	**Solve any two questions out of three.**	**16M**		
i)	Using a Flowchart to explain the working of Pass 1 of a Two Pass Assembler.	**8M**	CO2	U
ii)	Write the Three Address Code (TAC) notation for the following Arithmetic Expression : p= a+b - (c * d)/e	**8M**	CO6	Ap
iii)	Explain any 5 Code Optimization techniques with proper examples.	**8M**	CO6	U