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**GIET UNIVERSITY, GUNUPUR – 765022**  
**M.C.A (Third Semester) Examinations, January – 2023**  
**MCA20301 - Compiler Design**

Time: 3 hrs

Maximum: 70 Marks

**The figures in the right hand side indicate marks**

**PART – A****(2 x 10 = 20 Marks)****Q1. Answer ALL questions**

	CO #	PO #
a. Write the differences between compiler and interpreter.	2	1
b. Mention the steps involved in Code Optimization Technique	2	2
c. What is cross compiler?	1	1
d. Define LR(1) item.	2	2
e. Find the First and Follow of the following grammar. $S \rightarrow aABb$ $A \rightarrow c \mid \epsilon$ $B \rightarrow d \mid \epsilon$	3	2
f. Define Code Optimization.	3	1
g. Define Boot Strapping.	1	2
h. Mention all Top Down and Bottom Up Parsers.	1	1
i. Mention the issues of Code Generation.	2	1
j. Mention the Loop Optimization Techniques.	2	1

**PART – B****(10 x 5 = 50 Marks)****Answer ANY FIVE questions**

	Marks	CO #	PO #
2. Describe the phases of compiler design in detail and write the output for each phase of the compiler design for the following instructions. a. $M=N+O+P*100$ b. $X=Y*Z*90$	10	2	1
3a Check whether the following grammar is in LL(1) or not and Construct the predictive parsing table for it. $S \rightarrow AB \mid eDa$ $A \rightarrow ab \mid c$ $B \rightarrow dC$ $C \rightarrow eC \mid \epsilon$ $D \rightarrow fD \mid \epsilon$	6	2	2
b Write a note on Synthesized attributes and Inherited attributes with examples.	4	2	2
4a Construct SLR Parsing Table for the following grammar $S \rightarrow L=R$ $S \rightarrow R$ $L \rightarrow *R$ $L \rightarrow id$ $R \rightarrow L$	6	2	2
4b What is Left Recursion? Remove Left Recursion from the following grammar. $S \rightarrow SS+ \mid SS^* \mid a$	4	2	2

5 a.	Write a note on Error Detection and Recovery.	5	2	1
b.	Define DAG. Represent the DAG for following Three Address Code. T1=a+b T2=a-b T3=T1*T2 T4=T1-T3 T5=T4+T3	5	2	1
6a	Describe Peephole Optimization in detail.	5	2	2
b	Write a note on Symbol Table Management	5	2	2
7a.	Define TAC. Write the Quadruple & triple for the following expression X = -Y * (Z+M)	5	3	3
b.	Define SDD. Write the SDD for $S \rightarrow \text{if (A) B1 else B2}$	5	4	2
8 a.	Mention the basic blocks for the instruction p=1; for (i=2; i<=x; i++) { p=p*i; } p=p+1;	5	4	1
b.	Write a note on Register Allocation and Register Assignment	5	4	1

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