Enrollment No._____

NAVRACHANA UNIVERSITY
a UGC recognized University

School: School of Engineering and Technology
Program/s: IT
Year: 4th **Semester:** 7th
Examination: End Semester Examination
Examination year: December - 2021

Course Code: IT405 **Course Name:** Compiler Design
Date: 03/12/2021
Time: 11:30 am to 01:30 pm

Total Marks: 40
Total Pages: 3

Instructions:

- *Write each answer on a new page.*
- *Use of a calculator is permitted.*
- *Draw all relevant waveforms in answer sheet only.*
- ** COs=Course Outcome mapping. # BTL=Bloom's Taxonomy Level mapping*

Q. No.	Details	Marks	COs*	BTL#
Q.1	Objective Type Questions - (All are compulsory) (Each of one mark)	10		
	1. A compiler is A. A program that place program into memory and prepares them for execution B. A program that automates the translation of assembly language into machine language C. Program that accepts program written in high level language and produces machine level language. D. A program that appears to execute a source program as if it were machine language		CO1	BT1
	2. The major area for optimization is a loop as A. Loop may go to infinite execution B. Condition check takes exceedingly large time C. Loop body is repeated several times D. None of the above		CO2	BT1
	3. Given the following Syntax Directed Definition is: **Production** / **Semantic Rule** A->BC / B.i = A.i; C.i = B.s; A.s = C.s B->XY / Y.i = B.i A. L-attributed definition B. S-attributed definition C. Both L-attributed definition and S-attributed definition D. None of the mentioned		CO3	BT4
	4. Recursive descent parsing is an example A. Top down parsing B. Bottom up parsing C. Predictive parsing D. None of the above		CO1	BT1

	5. The symbol table information – A. Is used by code generator and optimizer B. Is filled up by code generator and optimizer C. Is filled up by lexical analyzer and optimizer D. Is used by parser and optimizer		CO1	BT1
	6. Choose the statement which is incorrect with respect to dynamic memory allocation. A. Memory is allocated in a less structured area of memory, known as heap B. Used for unpredictable memory requirements C. Execution of the program is faster than that of static memory allocation D. Allocated memory can be changed during the run time of the program based on the requirement of the program		CO2	BT3
	7. _____ is the Input to code generator. A. Intermediate code B. tokens C. Machine code D. Syntax tree		CO3	BT1
	8. A grammar for a programming language is a formal description of A. Syntax B. Semantics C. Structure D. Library		CO2	BT2
	9. A Bottom up parser generates Ans: _____ A. Right most derivation B. Right most derivation in reverse C. Left most derivation D. Left most derivation in reverse		CO2	BT1
	10. Which one is not a Compiler? A. C C. Python B. C++ D. Java		CO1	BT1
Q.2	Answer the following questions. (All are compulsory) (Each of one mark))	**5**		
	1. What is a symbol table?		CO1	BT2
	2. Compiler can detect Run time errors. (True/ **False**)		CO1	BT1
	3. Define Handle		CO3	BT1
	4. In LL(k) parser, k stands for _____.		CO2	BT1
	5. Define Token		CO1	BT1
Q.3	Answer the following questions. (Attempt any five) (Each of five mark))	**25**		
	1. Construct LL(1) parsing table for the following grammar and parse the string "***acb***" **S->aABb** **A->c| ϵ** **B->d| ϵ**		CO2	BT2

	2. Consider the grammar with the following translation rules and E as the start symbol. $E \rightarrow E1 \ @ \ T \ \{ E.value = E1.value * T.value \}$ $\quad \mid T \ \{ E.value = T.value \}$ $T \rightarrow T1 \ \& \ F \ \{ T.value = T1.value + F.value \}$ $\quad \mid F \{ T.value = F.value \}$ $F \rightarrow num \ \{ F.value = num.value \}$ Draw the annotated parse tree for following expression: ***1@ 2 & 4 @ 5***		CO3	BT5
	3. Why the intermediate code is important? Discuss various representations of three address code.		CO1	BT3
	4. Construct the LR(1) itemset for the following grammar. **S → AA** **A → aA** **A → b**		CO3	BT6
	5. Explain the loop optimization technique.		CO4	BT2
	6. Explain Stack Allocation and Activation Record Organization.		CO4	BT1
	7. Is following grammar LR(0) or SLR(1)? **S->AB** **A->a / ϵ** **B->b**		CO2	BT4

**********End of Question Paper**********