Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI • EXAMINATION – WINTER • 2014

Subject Code: 160706 Date: 08-12-2014

Subject Name: System Programming

Time: 02:30 pm - 05:00 pm Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Define following terms: **07**

1. System Program 2. Language Processor 3. Parsing
4. Operator Grammar 5. Handle 6. Assembler
7. Indirect Triple

(b) What is grammar? Explain types of grammar. Write an unambiguous grammar for an arithmetic expression containing the operators ↑ (exponentiation), +,*. **07**

Q.2 **(a)** Explain left recursion and left factoring with suitable example. **07**

(b) Given a grammar **07**

S→XS | dS | ε

X→Y | Zb | aY

Y→cZ

Z→e

Develop an LL(1) parsing table and check whether the string "dace" is accepted or not?

OR

(b) Write a regular expression for the language consisting of all strings ending with 1 and does not contain substring 00. Convert the resultant regular expression into Deterministic Finite Automata. **07**

Q.3 **(a)** Which are the different assembly language statements? Explain each of them with suitable example. **07**

(b) Explain use of various data structures needed in pass-I of the assembler and give details of their fields. **07**

OR

Q.3 **(a)** List out various assembler directives. Explain any three with example. **07**

(b) Given the following source program and code for mnemonics **07**

1. Show the content of the symbol table at the end of pass-I of a two pass assembler.
2. Show the intermediate code generated for program using variant-I of intermediate code representation.
   Assume that each instruction is one word.

Source Program			Mnemonics	code
	START	100	START	01
A	DS	3	END	02
L1	MOVER	AREG,B	ORIGIN	03
	ADD	AREG,C	EQU	04
	MOVEM	AREG,D	STOP	00
D	EQU	A+1	ADD	01
L2	PRINT	D	MOVER	04
	ORIGIN	A-1	MOVEM	05
C	DC	'5'	PRINT	10
	ORIGIN	L2+1	DC	01
	STOP		DS	02
B	DC	'25'	Ordinal number for AREG is 1	
	END	L1		

Q.4 **(a)** Explain default value parameter for macro and nested macro call with example. **07**

(b) Explain following facilities for expansion time loop with example. **07**

1. REPT statement
2. IRP statement

OR

Q.4 **(a)** Describe tasks and data structures considered for the design of a macro preprocessor. **07**

(b) What are advanced macro programming facilities? Explain with example. **07**

Q.5 **(a)** What is program relocation? How relocation is performed by linker. Explain with example. **07**

(b) Consider the statement a=b+c*10.where a, b, c are of type float. Show the translation of the given statement by different phases of compiler to produce assembly language statement. **07**

OR

Q.5 **(a)** What is code optimization? Explain with example various optimizing transformations. **07**

(b) Write a short note on absolute loader. **07**

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