

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 $\uparrow$ (exponentiation), $+$, $*$. **07**
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- Q.2** (a) Explain left recursion and left factoring with suitable example. **07**
- (b) Given a grammar **07**
- $S \rightarrow XS \mid dS \mid \epsilon$
 $X \rightarrow Y \mid Zb \mid aY$
 $Y \rightarrow cZ$
 $Z \rightarrow e$
- 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**
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- 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**
