Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER – V (NEW) EXAMINATION – WINTER 2015

Subject Code: 2150708 **Date:10/12/ 2015**

Subject Name: System Programming

Time:10:30am to 1:00pm **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)** (i) Compare Problem oriented and Procedure oriented languages. **07**

(ii) Define Following terms:

1. System Software
2. Semantic Gap
3. Specification Gap
4. Execution Gap

(b) (i) Explain types of grammars. **07**

(ii) Write a regular expression for a language containing a binary string which does not contain two consecutive 0s or two consecutive 1s anywhere.

Q.2 **(a)** Explain the various stages of the life cycle of a source program with a neat diagram. **07**

(b) Consider following assembly language program: **07**

Show (i) Contents of Symbol Table (ii) Intermediate codes using Variant I representation.

	START	101
	READ	N
	MOVER	BREG, ONE
	MOVEM	BREG, TERM
AGAIN	MULT	BREG, TERM
	MOVER	CREG, TERM
	ADD	CREG, ONE
	MOVEM	CREG, TERM
	COMP	CREG, N
	BC	LE, AGAIN
	MOVEM	BREG, AGAIN
	PRINT	RESULT
	STOP	
N	DS	1
RESULT	DS	1
ONE	DC	'1'
TERM	DS	1
	END	

Instruction opcode: STOP – 00, ADD – 01, MULT – 03, MOVER – 04, MOVEM – 05, COMP – 06, BC – 07, READ – 09, PRINT – 10, LE – 02

Assembler directives: START – 01, END – 02

Declaration statements: DC – 01, DS – 02

Register code: BREG – 02, CREG – 03

OR

(b) Explain language processing activities. **07**

Q.3	**(a)**	Construct NFA and DFA for following regular expression: (0 | 1)*001#	**07**
	(b)	What is program relocation? How relocation is performed by linker? Explain with example.	**07**
		OR	
Q.3	**(a)**	Explain recursive descent parsing algorithm.	**07**
	(b)	List various phases of a language processor. Explain roles of phases of Language Processor. Also explain symbol table.	**07**
Q.4	**(a)**	Define forward references. How it can be solved using back-patching? Explain with example.	**07**
	(b)	Explain Absolute Loader with example.	**07**
		OR	
Q.4	**(a)**	Explain advanced assembler directives with suitable example.	**07**
	(b)	What is macro preprocessor? Explain steps of macro preprocessor design.	**07**
Q.5	**(a)**	List out and explain various optimizing transformations of a compiler by giving suitable examples.	**07**
	(b)	What is interpreter? Explain benefits of interpreter. Compare interpreter and compiler.	**07**
		OR	
Q.5	**(a)**	Define two macros of your choice to illustrate nested calls to these macros. Also show their corresponding expansion.	**07**
	(b)	What are advanced macro programming facilities? Explain with example.	**07**

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