

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: **07**
 $(0 \mid 1)^*001\#$
- (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**
