

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER- V (New) EXAMINATION – WINTER 2019****Subject Code: 2150708****Date: 21/11/2019****Subject Name: System Programming****Time: 10:30 AM TO 01:00 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) What are the advantages and disadvantages of procedure oriented language? **03**
- (b) Define following terms:- **04**
1. System Software
  2. Semantic gap
  3. Specification gap
  4. Execution gap
- (c) Explain the various stages of the life cycle of a source program with a neat diagram. **07**
- Q.2**
- (a) Give examples of language processors. **03**
- (b) Difference between one pass and two pass assembler. **04**
- (c) Consider the following assembly language program and explain role of OPTAB,SYMTAB,LITTAB,POOLTAB with its contents. **07**

```

START      300
MOVER      AREG, '=5'
MOVEM      AREG,R1
AGAIN      MOVER      AREG,R1
           MOVER      CREG,R2
           ADD        CREG,='1'
           BC         ANY,TERM
           .....
           LTORG
           = '5'
           = '1'
           .....
TERM       SUB        AREG,='1'
           BC         LT,DOWN
LAST       STOP
           ORIGIN     LOOP+2
           MULT       CREG,R2
           ORIGIN     LAST+1
R1         DS         1
DOWN       EQU        LOOP
R2         DS         1
           END
           = '1'

```

**OR**

- (c) List out various assembler directives. Explain any three in detail. **07**
- Q.3** (a) Write definition of :- **03**
1. Macro expansion
  2. Lexical expansion

3. Semantic expansion

- (b) Illustrate expansion of nested macro calls by giving example. **04**  
(c) Explain macro expansion in detail. **07**
- OR**
- Q.3** (a) Draw figure of macro preprocessor. **03**  
(b) Explain positional parameters, keyword parameters and default value parameters for macro. **04**  
(c) What are advanced macro programming facilities? Explain with example. **07**
- Q.4** (a) What is backtracking? **03**  
(b) Difference between Top Down parser and Bottom Up parser. **04**  
(c) What is program relocation? How relocation is performed by linker. Explain with example. **07**
- OR**
- Q.4** (a) Explain lexical analysis of language processor. **03**  
(b) List and explain various types of grammar. **04**  
(c) What is overlay? Explain the execution of an overlay structured program. **07**
- Q.5** (a) Why translators are needed? **03**  
(b) Write example of recursive macros. **04**  
(c) Consider the grammar  $E \rightarrow E - E$  **07**  
 $E \rightarrow E * E$   
 $E \rightarrow id$   
Perform Shift-Reduce parsing of the input string  
"id1-id2\*id3"
- OR**
- Q.5** (a) What is analysis and synthesis part of compilation? **03**  
(b) Describe ambiguity in grammar specification. **04**  
(c) Define simple phrase and handle. Using handle and simple phrase trace the bottom up parsing algorithm. **07**  
Grammar is :  $E \rightarrow T + E \mid T - E \mid T$   
 $T \rightarrow T * V \mid T / V \mid T$   
 $V \rightarrow a \mid b \mid c \mid d$   
String is : a - b \* c + d

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