

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-V (NEW) EXAMINATION – WINTER 2020

Subject Code:2150708
Date:20/01/2021
Subject Name:System Programming
Time:10:30 AM TO 12:30 PM
Total Marks: 56
Instructions:

1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

	MARKS
Q.1 (a) State True or False	03
1. Language processing activities of an interpreter can be separated from its program execution activities. 2. A compiler uses a queue to compile nested control structures in a program. 3. Scope rule determines the accessibility of variables declared in different blocks of a program.	
(b) Considering the following expression grammar, discuss the ambiguity in grammatical specification.	04
$\langle \text{exp} \rangle ::= \langle \text{id} \rangle \mid \langle \text{exp} \rangle + \langle \text{exp} \rangle \mid \langle \text{exp} \rangle * \langle \text{exp} \rangle$ $\langle \text{id} \rangle ::= a \mid b \mid c$	
(c) Do as directed:	07
1. What is the output of scanning phase of a compiler? 2. Grammar of the programming is checked at _____ phase of compiler. 3. What is the role of POOLTAB data structure in Pass-I of an assembler? 4. What is the use of value numbering in local optimization of a program? 5. Which kind of macro expansion implies generation of instruction tailored to the requirements of a specific usages? 6. If the Linked origin \neq Translated origin, will the linker performs the relocation? 7. What is the relevance of 1 in LL (1) parser?	
Q.2 (a) Explain how Reference Count method assist memory management.	03
(b) What is left recursion? Eliminate the left recursion from the following grammar.	04
$E \rightarrow E + T \mid T$ $T \rightarrow T * F \mid F$ $F \rightarrow (E) \mid \text{id}$	
(c) Compare and contrast recursive descent parsing with LL (1) parsing. What grammar forms are acceptable to each of these?	07
Q.3 (a) In which situation, assembly language programming holds an edge over high level language programming?	03

- (b) Justify the statement, “The use of Type 3 production (grammar) is restricted to the specification of lexical units”. **04**
- (c) Discuss the following assembler directives with example: a) ORIGIN b) EQU **07**
- Q.4** (a) What is the relevance of LITAB and OPTAB data structure in two pass assembler? **03**
- (b) Discuss the need for left factoring in grammar? Explain it with suitable example. **04**
- (c) Compare and contrast variant-I & II of the intermediate code for imperative statements in assembler. **07**
- Q.5** (a) State the limitations of stack based memory allocation model. **03**
- (b) What do you mean by relocatable and non relocatable programs? **04**
- (c) Discuss the macros with mixed parameter lists (i.e., keyword and position parameter) with example. **07**
- Q.6** (a) What do you mean by Optimization Transformation? **03**
- (b) Discuss the role of linker and loader. **04**
- (c) Discuss various data structure involved in macro preprocessing with suitable example. **07**
- Q.7** (a) List out the various components of an Object Module. **03**
- (b) Discuss the role of Profile Monitor. **04**
- (c) Discuss various compiler optimization techniques with example. **07**
- Q.8** (a) Justify, “Indirect Triples is useful in optimizing compilers”. **03**
- (b) Discuss the role of Debug Monitor. **04**
- (c) Explain in detail, how the linker resolves the external references. **07**
