

[This question paper contains 4 printed pages.]

Sr. No. of Question Paper : 776

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Your Roll No.....

Unique Paper Code : 234303

Name of the Paper : System Programming

Name of the Course : **B.Sc. (H) Computer Science**

Semester : III

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. The paper has **two** sections.
3. **All** the questions in the '**Section A**' are compulsory.
4. Attempt **any four** questions from '**Section B**'.
5. Parts of a question must be answered together.

SECTION A

1. (i) Write the use of Test Device (TD) instruction. (3)
(ii) "T0010001E141033" is an example of Text Record.
Write the format of Text Record and explain above given example. (4)
(iii) What is the purpose of bit mask in an object code ? Give an example. (3)
(iv) Describe the Activation Record created in a dynamic storage allocation technique ? (3)
(v) What is Lexical Analysis ? (3)
(vi) Write the use of LOCCTR variable. (2)

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- (vii) What is meant by macro time variable ? Give an example. (3)
- (viii) Write the Algorithm for Absolute Loader ? (4)
- (ix) (b) Consider the instructions in SIC/XE programming :
- ```

10 1000 LENGTH RESW 4
20 ----- NEW WORD 3

```
- What is the address assigned to the symbol NEW ? (2)
- (x) What is the purpose of the following Loader Option ?
- CHANGE RDREC, READ (2)
- (xi) What is a Language Processor ? Write about different types of Language Processors. (3)
- (xii) What is context free grammar ? Give an example. (3)

### SECTION B

2. (a) Assemble the following SIC/XE code. (6)

|        |       |                |
|--------|-------|----------------|
| STRCP2 | START | 1000           |
| FIRST  | LOT   | #11            |
|        | LDX   | #0             |
| MOVECH | LDCH  | STR1,X         |
|        | STCH  | STR2,X         |
|        | TIXR  | T              |
|        | JLT   | MOVECH         |
| STR1   | BYTE  | C'TEST STRING' |
| STR2   | RESB  | 11             |
|        | END   | FIRST          |

Opcodes for the Mnemonics are :

|     |     |      |      |      |     |
|-----|-----|------|------|------|-----|
| LDT | LDX | LDCH | STCH | TIXR | JLT |
| 74  | 04  | 50   | 54   | B8   | 38  |

- (b) With the help of a diagram, describe processing of an object program using Linkage Editor ? (4)
3. (a) Explain conditional macro expansion with an example. (4)
- (b) Write the algorithm of GETC subroutine of Bootstrap loader ? Explain its use. (6)
4. (a) What are the three main data structures used by a macro processor ? (6)
- (b) What is Quadruple ? Write the quadruple for the statement given below ?  
 $M := A \text{ DIV } 100 - B * B$  (4)
5. (a) What are the advantages of Code Optimization ? Explain any two Code Optimization techniques. (6)
- (b) Describe Language processing activities. (4)
6. (a) Draw Parse tree for the following statement :  
 $S = (A/B) + (C*D)$  (3)
- (b) What is Recursive Decent Parsing ? Explain with the help of an example. (4)
- (c) Write the sequence of instructions for SIC machine to set ALPHA equal to  $4*BETA-9$ . Assume that Alpha and BETA are defined as one word variables. (3)

7. (a) What are Language Processor Development tools ? Explain through schematic diagram. (4)
- (b) Design a Finite Automata for recognizing an identifier (an identifier begins with a letter followed by an underscore or a letter or a digit and should not end with an underscore). (3)
- (c) Explain the working of a Load and Go Assembler. (3)