

This question paper contains 4+1 printed pages]

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S. No. of Question Paper : 6071

Unique Paper Code : 234303

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Name of the Paper : System Programming

Name of the Course : B.Sc. (Hons.) Computer Science (CSHT-306)

Semester : III

Duration : 3 Hours

Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

The question paper consists of two Sections.

Section A is compulsory.

Attempt any four questions from Section B.

### Section A

1. Differentiate between the following : 6
  - (a) System Software and Application Software.
  - (b) Absolute and Relative Expression.
2. List the format of 3 byte and 4 byte instructions available in SIC/XE machine. 3
3. What typical options are available in a loader ? 4
4. Explain LOCCTR maintenance during generation of object code. 3
5. Give the format of the following : 4
  - (a) Define Record
  - (b) Refer Record.

P.T.O.

- 6. Explain Finite Automata (FA) with the help of an example. 4
- 7. Write short notes on the following : 6
  - (a) Storage allocation
  - (b) Semantic analysis.
- 8. Define Ambiguous Grammar. Consider the following grammar :

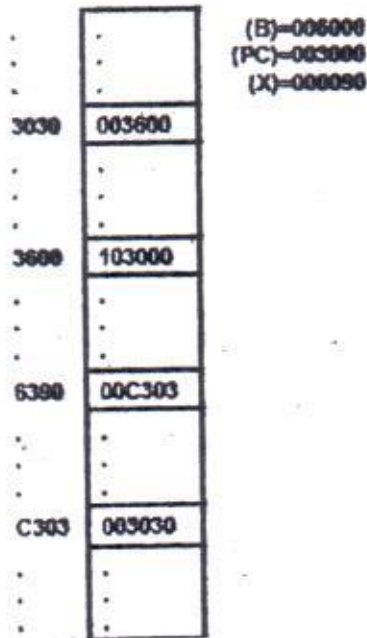
$$S \rightarrow \text{if } E \text{ then } S \mid \text{if } E \text{ then } S \text{ else } S \mid \text{OTHER}$$

Check for ambiguity of the following :

If E1 then if E2 then S3 else S4. 5

**Section B**

- 9. (a) Consider the memory contents shown in the following figure. What would be loaded to register A with the object code 022030 (Hex) ? Justify your answer. 3



- (b) How relocation is done by Modification Record ? Explain the following Modification Record : M00000705. 3
- (c) What do you mean by Recursive Descent Parsing ? 4
10. (a) Assemble the following SIC/XE object code and show object code as would appear in object file : 4+2

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

P.T.O.

Opcode for the Mnemonics are :

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

- (b) Explain with an example how concatenation operator is helpful to concatenate macro-instruction parameter with character strings. 4
11. (a) What is the advantage of rearranging a program in the form of program blocks ? 3
- (b) Describe the data structure used in macro processor algorithm. 3
- (c) What is Lexical Analysis ? 4
12. (a) What is the disadvantage of an absolute loader and how can it be overcome by relocating loader ? 3
- (b) Explain recursive macro expansion with suitable example. 3
- (c) Give a comparison of context-free and context-sensitive grammar. 4

- 13. (a) Explain the difference between linking loader and linkage editor. 4
- (b) How compilers for most high level language store arrays ? 2
- (c) What do you mean by Prologue and Epilogue with respect to an activation record ? 4
- 14. (a) How BNF Grammar is used to describe syntax ? 3
- (b) What is a program translation ? Give its characteristics. 3
- (c) What is a LPDT ? Write a brief description of YACC. 4

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