

SYSTEM SOFTWARE 2 MARKS QUESTIONS

UNIT I - INTRODUCTION

1. Define system software.

It consists of variety of programs that supports the operation of the computer. This software makes it possible for the user to focus on the other problems to be solved without needing to know how the machine works internally.

Eg: operating system, assembler, and loader.

2. Give some applications of operating system.

- To make the computer easier to use
- To manage the resources in computer
 - Process management
- Data and memory management
- To provide security to the user.
 - Operating system acts as an interface between the user and the system
 - Eg: windows, linux, unix, dos

3. Define compiler and interpreter

Compiler is a set of program which converts the whole high level language program to machine language program, Interpreter is a set of programs which converts high level language program to machine language program line by line

4. Define loader.

Loader is a set of program that loads the machine language translated by the translator into the main memory and makes it ready for execution.

5. What is the need of MAR register?

MAR (memory address register) is used to store the address of the memory from which the data is to be read or to which the data is to be written.

6. Give any two differences between base relative addressing and program counter relative addressing used in SIC/XE.

Base relative addressing

Target address is calculated using the formula

Target address = Displacement + [B]

B-base register

Displacement lies between 0 to 4095

7. Define indirect addressing

PC relative addressing

The target address is calculated using the formula

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Target address = Displacement + [PC]

PC-program counter

Displacement lies between -2048 to 2047

In the case of immediate addressing the operand field gives the memory location. The word from the given address is fetched and it gives the address of the operand.

Eg: ADD R5, [600]

Here the second operand is given in indirect addressing mode. First the word in memory location 600 is fetched and which will give the address of the operand.

8. Define immediate addressing.

In this addressing mode the operand value is given directly. There is no need to refer memory. The immediate addressing is indicated by the prefix „#“.

Eg: ADD #5

In this instruction one operand is in accumulator and the second operand is a immediate value. The value 5 is directly added with the accumulator content and the result is stored in accumulator

9. What is the name of A and L register in SIC machine and also specify its use.

A-accumulator

Used for arithmetic operation. ie in the case of arithmetic operations one operand is in the accumulator, and other operand may be an immediate value, register operand or memory content. The operation given in the instruction is performed and the result is stored in the accumulator register.

L-linkage register

It is used to store the return address in the case of jump to subroutine (JSUB) instructions.

10. What is the difference between the instructions LDA # 3 and LDA THREE?

In the first instruction immediate addressing is used. Here the value 3 is directly loaded into the accumulator register.

In the second instruction the memory reference is used. Here the address (address assigned for the symbol THREE) is loaded into the accumulator register.

11. How do you calculate the actual address in the case of register indirect with immediate index mode?

Here the target address is calculated using the formula

T.A = (register) + displacement.

12. Write the sequence of instructions to perform the operation

BETA = ALPHA + 1 using SIC instructions.

LDA ALPHA

ADD ONE

STA BETA

□. □.

ALPHA RESW 1 BETA RESW 1 ONE RESW 1

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21. Write the sequence of instructions to perform the operation $BETA = ALPHA + 5$ using SIC/XE instructions.

```
LDA ALPHA
ADD #1
STA BETA
```

□.

```
ALPHA
BETA
```

```
RESW 1
RESW 1
```

22. What is the use of TD instruction in SIC architecture?

The test device (TD) instruction tests whether the addressed device is ready to send or receive a byte of data. The condition code is set to indicate the result of this test. Setting of < means the device is ready to send or receive, and = means the device is not ready.

23. Define the basic functions of assembler.

- Translating mnemonic operation codes to their machine language equivalents.
- Assigning machine addresses to symbolic labels used by the programmer.

24. What is meant by assembler directives? Give example.

These are the statements that are not translated into machine instructions, but they provide instructions to assembler itself.

Example: START, END, BYTE, WORD, RESW and RESB.

25. What is a forward reference?

It is a reference to a label that is defined later in a program.

Consider the statement

```
10 1000      STL  RETADR
```

```
. . . . .
```

```
. . . . .
```

```
80 1036 RETADR RESW 1
```

The first instruction contains a forward reference RETADR. If we attempt to translate the program line by line, we will be unable to process the statement in line 10 because we do not know the address that will be assigned to RETADR. The address is assigned later (in line 80) in the program.

25. What are the three different records used in object program?

The header record, text record and the end record are the three different records used in object program.

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The header record contains the program name, starting address and length of the program.

Text record contains the translated instructions and data of the program.

End record marks the end of the object program and specifies the address in the program where execution is to begin.

26. What is the need of SYMTAB (symbol table) in assembler?

The symbol table includes the name and value for each symbol in the source program, together with flags to indicate error conditions. Sometimes it may contain details about the data area. SYMTAB is usually organized as a hash table for efficiency of insertion and retrieval.

27. What is the need of OPTAB (operation code table) in assembler?

The operation code table contains the mnemonic operation code and its machine language equivalent. Some assemblers it may also contain information about instruction format and length. OPTAB is usually organized as a hash table, with mnemonic operation code as the key.

28. Define relocatable program.

An object program that contains the information necessary to perform required modification in the object code depends on the starting location of the program during load time is known as relocatable program.

29. Write the steps required to translate the source program to object program.

- Convert mnemonic operation codes to their machine language equivalents.
- Convert symbolic operands to their equivalent machine addresses
- Build the machine instruction in the proper format.
- Convert the data constants specified in the source program into their internal
- Machine representation
- Write the object program and assembly listing.

30. What is the use of the variable LOCCTR (location counter) in assembler?

This variable is used to assign addresses to the symbols. LOCCTR is initialized to the beginning address specified in the START statement. After each source statement is processed the length of the assembled instruction or data area to be generated is added to LOCCTR and hence whenever we reach a label in the source program the current value of LOCCTR gives the address associated with the label.

31. Differentiate the assembler directives RESW and RESB.

RESW -It reserves the indicated number of words for data area.

Eg: 10 1003 THREE RESW 1

In this instruction one word area (3 bytes) is reserved for the symbol THREE. If the memory is byte addressable then the address assigned for the next symbol is 1006.

RESB -It reserves the indicated number of bytes for data area.

Eg: 10 1008 INPUT RESB 1

In this instruction one byte area is reserved for the symbol INPUT. Hence the address assigned for the next symbol is 1009.

16. Define modification record and give its format

This record contains the information about the modification in the object code

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during program relocation. The general format is

Col 1 M

Col 2-7 starting location of the address field to be modified relative to the beginning of the program

Col 8-9 length of the address field to be modified in half bytes.

32. Write down the pass numbers(PASS 1/ PASS 2) of the following activities that occur in a two pass assembler:

- a. Object code generation
- b. Literals added to literal table
- c. Listing printed
- d. Address location of local symbols

Answer:

- a. Object code generation - PASS 2
- b. Literals added to literal table - PASS 1
- c. Listing printed - PASS2
- d. Address location of local symbols - PASS1

33. What is meant by machine independent assembler features?

The assembler feature that does not depend upon the machine architecture is known as machine independent assembler features.

Eg: program blocks, Literals.

34. How the register to register instructions are translated in assembler?

In the case of register to register instructions the operand field contains the register name. During the translation first the object code is converted into its corresponding machine language equivalent with the help of OPTAB. Then the SYMTAB is searched for the numeric equivalent of register and that value is inserted into the operand field.

35. What is meant by external references?

Assembler program can be divided into many sections known as control sections and each control section can be loaded and relocated independently of the others. If the instruction in one control section need to refer instruction or data in another control section .the assembler is unable to process these references in normal way. Such references between controls are called external references.

36. Define control section.

A control section is a part of the program that maintains its identity after assembly; each control section can be loaded and relocated independently of the others. Control sections are most often used for subroutines. The major benefit of using control sections is to increase flexibility.

37. What is the use of the assembler directive START?

The assembler directive START gives the name and starting address of the program.

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The format is

PN START 1000

Here PN -name of the program

1000-starting address of the program.

UNIT V (TEXT EDITORS)

1. Define interactive editor?

An interactive editor is a computer program that allows a user to create and revise a target document. The term document includes objects such as computer programs, text, equations, tables, diagrams, line art, and photographs anything that one might find on a printed page.

2. What are the tasks performed in the editing process?

Four tasks

1. Select the part of the target document to be viewed and manipulated.
2. Determine how to format this view on-line and how to display it.
3. Specify and execute operations that modify the target document
- . 4. Update the view appropriately.

3. What are the three categories of editor's devices?

1. Text device/ String devices
2. Button device/Choice devices
3. Locator device

4. What is the function performed in editing phase?

In the actual editing phase, the target document is created or altered with a set of operations such as insert, delete, replace, move and copy.

5. Define Locator device?

Locator devices are two-dimensional analog-to-digital converters that position a cursor symbol on the screen by observing the user's movement of the device. The most common such devices for editing applications are the mouse and the data tablet.

6.define document

document consists of image,diagram,text,graphs etc

7. What are called tokens?

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The lexical analyzer tracks the source program one character at a time by making the source program into sequence of atomic units is called tokens.

8. Name some of typical tokens.

Identifiers, keywords, constants, operators and punctuation symbols such as commas and parentheses are typical tokens.

9. What is meant by lexeme?

The character that forms a token is said to be a lexeme.

10. Mention the main disadvantage of interpreter.

The main disadvantage of interpreter is that the execution time of interpreted program is slower than that of a corresponding compiled object program.

11. What is meant by code optimization?

The code optimization is designed to improve the intermediate code, which helps the object program to run faster and takes less space.

12. What is error handler?

The error handler is used to check if there is an error in the program. If any error, it should warn the programmer by instructions to proceed from phase to phase.

13. Name some of text editors.

line editors

stream editors screen editors

word processors structure editors

14. What for debug monitors are used?

Debug monitors are used in obtaining information for localization of errors.

18. Define user interface?

User interface is one, which allows the user to communicate with the system in order to perform certain tasks. User interface is generally designed in a computer to make it easier to use

15. Mention the features of word processors.

moving text from one place to another

merging of text

searching

word replacement

16. What are the phases in performing editing process?

a. Traveling phase

b. Filtering phase

c. Formatting phase

d. Editing phase

17. Define traveling phase.

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The phase specifies the region of interest. Traveling is achieved using operations such as next screenful, bottom, find pattern.

Filtering phase: -The selection of what is to be viewed and manipulated is given by filtering.

Editing phase: - In this phase, the target document is altered with the set of operations such as insert, delete, replace, move and copy.

18. Define input device?

Input device is an electromechanical device, which accepts data from the outside world and translates them into a form, which the computer can interpret.

20. Define output devices

An output device is the user to view the elements being edited and the results of the editing operations.

21. What are the methods in Interaction language of a text editor?

- A. Typing -oriented or text command oriented method
- B. Function key interfaces
- C. menu oriented method

22. Define interactive debugging systems

An interactive debugging system provides programmers with facilities that aid in the testing and debugging of programs.

1. Debugging functions and capabilities
2. Relationship with other parts of the system
3. User interface criteria.

23. Define editor structure.

The command language processor accepts input from the users input devices and analyzes the tokens and syntactic structure of the commands.

24. Give the components of editor structure

- a. Editing component
- b. Traveling component
- c. Viewing component
- d. Display component

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