**Sample Questions**

**Computer Engineering**

**Subject Name:** System Programming and Compiler Construction  
**Semester:** VI

### Multiple Choice Questions

<table>
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<tr>
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<th>Choose the correct option for following questions. All the Questions carry equal marks</th>
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<tbody>
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<td>1.</td>
<td>Which of the following is designed to control the operations of a computer?</td>
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<td>Option A: Application Software</td>
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<td>Option B: <strong>System Software</strong></td>
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<td></td>
<td>Option C: Utility Software</td>
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<td></td>
<td>Option D: User</td>
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| 2. | A person who designs the programs in a software package is called:                     |
|    | Option A: User                                                                          |
|    | Option B: Software Manager                                                              |
|    | Option C: System Developer                                                              |
|    | Option D: **System Programmer**                                                         |

| 3. | Assembler is used as a translator for?                                                  |
|    | Option A: **Low level language**                                                        |
|    | Option B: High Level Language                                                           |
|    | Option C: COBOL                                                                         |
|    | Option D: C                                                                             |

| 4. | They normally interact with the system via the user interface provided by the application software. |
|    | Option A: Programmers                                                                   |
|    | Option B: Developers                                                                    |
|    | Option C: **Users**                                                                     |
|    | Option D: Testers                                                                       |

| 5. | Storage mapping is done by_________________                                               |
|    | Option A: Linker                                                                       |
|    | Option B: **Compiler**                                                                 |
|    | Option C: Loader                                                                       |
|    | Option D: Operating system                                                             |

| 6. | Interpreter is used as a translator for__________                                        |
|    | Option A: Low level language                                                            |
|    | Option B: **High Level Language**                                                      |
|    | Option C: COBOL                                                                         |
|    | Option D: C                                                                             |
7. A system program that sets up an executable program in main memory ready for execution is
   Option A: **Loader**
   Option B: Linker
   Option C: Assembler
   Option D: load and go

8. The ___ of a system includes the program s or instructions.
   Option A: Icon
   Option B: **Software**
   Option C: Hardware
   Option D: Information

9. Instructions which won’t appear in the object program are called as ___
   Option A: Redundant instructions
   Option B: Exceptions
   Option C: Mnemonic opcode
   Option D: **Assembler Directives**

10. The last statement of the assembly program should be ______
    Option A: STOP
    Option B: RETURN
    Option C: TERMINEATE
    Option D: **END**

11. Translator for low level programming language were termed as
    Option A: **Assembler**
    Option B: Compiler
    Option C: Linker
    Option D: Loader

12. The Macro processor is also called as ______
    Option A: **Preprocessor**
    Option B: Postprocessor
    Option C: Debugger
    Option D: Translator

13. In parameterised macro, the parameter is mapped using____
    Option A: **by position**
    Option B: by keyword
    Option C: by reference
    Option D: by string

14. The linker is a software that is used for____
    Option A: **Creating single executable load module**
    Option B: Executing the program
    Option C: Creating link between program and data
    Option D: Helping loader to load program in memory
<table>
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<tr>
<th>Question</th>
<th>Options</th>
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</table>
| 15. Which is not a function of a loader | Option A: Allocation  
Option B: **Translation**  
Option C: Relocation  
Option D: Loading |
| 16. Which of the following software always resides in main memory? | Option A: Text editor  
Option B: Assembler  
Option C: Linker  
Option D: **Loader** |
| 17. What type of data structure is used by shift reduce parser | Option A: linked list  
Option B: **Stack**  
Option C: Queue  
Option D: Pointer |
| 18. We can optimize code by | Option A: **Dead code elimination**  
Option B: Common subprogram  
Option C: Copy intermediate loop  
Option D: Loop declaration |
| 19. Local and loop optimization in turn provide motivation for | Option A: **Data flow analysis**  
Option B: Constant folding  
Option C: Pee hole optimization  
Option D: DFA |
| 20. Compiler can check ________ error | Option A: Logical  
Option B: **Syntax**  
Option C: both a and b  
Option D: Content |

**Descriptive Questions**

- What is the forward reference problem? Explain single pass assembler with flowchart.
- Explain multi pass assembler in detail.
- Show machine code generated for following assembly level program along with data structures entries.
- Explain single pass macro processor.
- Explain the working of macro processor along with the data structures used in it.
- Explain the working of DLL loader in detail.
Draw and Explain the various phases of compilers with suitable example.

Modify the given grammar and construct a Predictive parser table explaining each step.

E->E+T | T
T->T*V | V
V-> id.

<table>
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<tr>
<th>For a given grammar below, Construct operator precedence relation matrix, assuming *, + are binary operators and 'id' is terminal symbol, and E as Non terminal.</th>
<th>E-&gt;E+E</th>
<th>E-&gt;E*E</th>
<th>E-&gt;id</th>
<th>Apply operator precedence parsing algorithm for the statement 'id + id * id'.</th>
</tr>
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</table>

Consider the following grammar: S --> aSbS | bSaS | Epsilon.

1. Frame the transition table and action / goto table of the given grammar.
2. Demonstrate if the grammar is LR(0) or not.

Explain the working of shift reduce parser along with suitable example

Explain the different forms of intermediate codes used by Compiler.

What is code optimization? Explain machine dependent code optimisation techniques with suitable example

Explain machine independent code optimization techniques with suitable example

Discuss various issues that occur in the code generation phase of the compiler.

Explain the difference between Compiler and Interpreter

Define the various system softwares used in compilers

What is the need of system softwares?

Explain various data structures used in assembler design

What is the need of an assembler to be multi pass?

Explain various types of statements used in assembler design

What are the different functions performed by macroprocessor?

Explain Parameterized macro with suitable example

Explain conditional macro with suitable example.

What are the different functions performed by loader

Enlist different types of noodles and explain compile and go loader in detail

Explain the working of absolute loader.

What do you mean by relocation? Explain relocating loader in detail.

Explain the difference between linking loader and linkage editor.

Explain the working of compiler phases for following expression Position = initial + rate * 60.

Explain the role of finite automata in lexical analysis

Design DFA for given finite automata. (a+b)*abb

Differentiate between top down and bottom up parser.

Define synthesized and inherited attributes used in Syntactic analysis of compiler.

Generate three address code for the following logical expression. If a<b then 1 else 0

Design quadruple and triple for following expression a=(b+c)*(d+e)

Design DAG representation for given expression. a=(a+b)*(a-c)

Explain flow graphs and basic blocks in detail.

Write a short note on LEX and YACC.