**SRM Institute of Science and Technology**

Mode of Exam

**OFFLINE**

**College of Engineering and Technology**

**SCHOOL OF COMPUTING**

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu

**Academic Year: 2022-23 (EVEN)**

**Test: CLAT-1 Date: 17.2.2022**

**Course Code & Title: 18CSC304J COMPILER DESIGN Duration: 1 HOUR**

**Year & Sem: III & V Max. Marks: 25**

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| **Part – A ( 5 x 1 = 5 Marks) Instructions: Answer ALL** | | | | | | |
| **Q. No** | **Question** | **Marks** | **BL** | **CO** | **PO** | **PI Code** |
| **1** | NFA with ϵ transitions \_\_\_\_\_\_\_   1. **Increases computations** 2. **Decreases computations** 3. **Decreases number of states** 4. **Increases uncertainty**   **Ans: a** | **1** | **1** | **1** | **1** | **1.3.1** |
| **2** | **What are the maximum number of tokens generated in the lexical analysis phase for the statement? printf("a = %f, &a = %d, b=%d", a, &a,b);**  **a) 10**  **b) 12**  **c) 17**  **d) 18**  **Ans: b** | **1** | **2** | **1** | **1** | **1.1.2** |
| **3** | If L,D, S denote the sets of letters, digits and underscore respectively. Then , which can possibly define an identifier?   1. **S(LUD)+** 2. **(LUS)(LUDUS)\*** 3. **(LUS)(LUD)\*** 4. **L(L.D.S)\***   **Ans: b** | **1** | **2** | **1** | **1** | **1.1.2** |
| **4** | The error of missing parenthesis detection occurs in \_\_\_\_\_\_\_ phase.  **a) Semantic**  **b) Lexical**  **c) Syntax**  **d) Syntax and lexical**  **Ans: c** | **1** | **1** | **1** | **1** | **1.3.1** |
| **5** | I: DFA’s can be constructed for all the languages  II: The strings accepted by DFA will be accepted by NFA  What can be said about these two statements?   1. **Only II is false** 2. **Only I is false** 3. **I is false and II is true** 4. **II is true and I is false**   **Ans: c or d** | **1** | **2** | **1** | **2** | **2.1.1** |
| **Part – B ( 2 x 4 = 8 Marks) Instructions: Answer TWO** | | | | | | |
| **6** | Explain the process of input buffering for the given source code.  int i,j;  i=i+1;  j=j+1;  Explain the process with one buffer(size:5) and two buffer (size 5 ) concepts  Answer: Definition and One buffer scheme with example (2 marks), two buffer scheme – 2 marks   * Sometimes lexical analyzer needs to look ahead some symbols to decide about the token to return   + In C language: we need to look after -, = or < to decide what token to return   + In Fortran: DO 5 I = 1.25 * We need to introduce a two buffer scheme to handle large look-aheads safely     Two pointers – Begin pointer (bp), Forward pointer (fp) | **4** | **3** | **1** | **2** | **2.1.1** |
| **7** | Raju is authoring a book on compiler. He makes sure that the first page is an index page followed by two acknowledgement pages. Design a DFA for the language L=all strings over {a,b}.  Note: index page and acknowledgment pages are referred to strings ‘a’, ‘b’ respectively.  Answer: Recognition – 2marks, DFA – 2marks | **4** | **2** | **1** | **2** | **1.1.2** |
| **8** | Draw the transition diagrams for unsigned integers and relational operators.  Answer:  unsigned integers – 2marks  relational operators – 2marks  Unsigned integers:    Relational operators: | **4** | **1** | **1** | **1** | **1.3.1** |
| **Part – C ( 1 x 12 = 12 Marks) Instructions: Answer any ONE** | | | | | | |
| **9** | Convert the following RE=a(a|b)\*abb to DFA using subset construction method and minimize it.  Answer: RE to NFA – 4marks, NFA to DFA – 4marks, minimization of DFA – 4marks | **12** | **3** | **1** | **2** | **2.1.2** |
| **OR** | | | | | | |
| **10** | 1. Perform minimization technique on the following DFA     Answer:         1. Define token, pattern and lexeme with example   Definitions – each 1 mark  A token is a pair a token name and an optional token value  A pattern is a description of the form that the lexemes of a token may take  A lexeme is a sequence of characters in the source program that matches the pattern for a token | **5+7** | **3** | **1** | **2** | **2.1.2** |