1) Regular Expression

a) Reserve Words

$$letter \, (letter)^+$$

b) Numbers

$$digit^+ \mid ((digit)^+ \, \text{"."} \, (digit)^+)$$

c) Identifiers

$$letter \, (letter^{+\bullet} \, \_ \, ^\bullet \mid ^\bullet \, \_ \, ^\bullet \mid (letter^+ \, digit) \mid digit) \, (letter \mid digit \mid (\_)^+ \, (letter \mid digit))^*$$

$$(letter^+ \, digit \mid digit) \, (letter \mid digit \mid (\_)^+ \, (letter \mid digit)) \, ^* \mid (digit ((\_) \mid letter \mid digit)^* \, letter^+ (\_)^* (letter \mid digit))$$

d) Operators

$$(\, < \mid > \mid \, != \mid < > \mid := \mid == \mid / \mid * \mid + \mid - \mid ++ \mid -- \mid += \mid -= \mid \&\& \mid \&\mid \mid \mid \mid \mid \& \,)$$

e) Punctuations

$$(\, [\mid] \mid \{ \mid \} \mid \text{"} \, \text{''} \mid (\mid) \,)$$

f) Comments

$$(// \, (letter \mid digit \mid \text{"}\_\text{"})^+)$$ Single Line

$$(/* \, (letter \mid digit \mid \text{"}\_\text{"})^+ \, */)$$ Multi Line

g) User Input and Operators
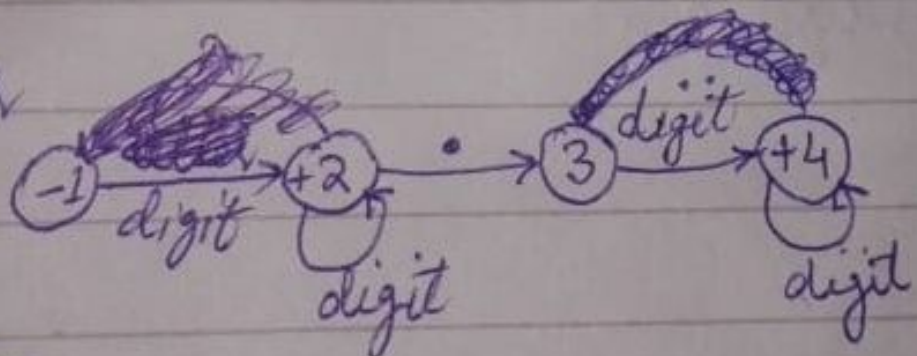   >>>

h) User Output and Operators
   <<<

2) ~~DFA~~ NFA

a) Reserve Words
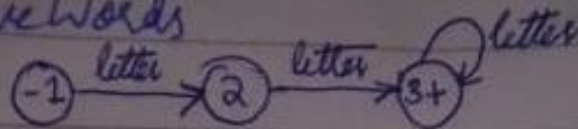
b) Identifiers
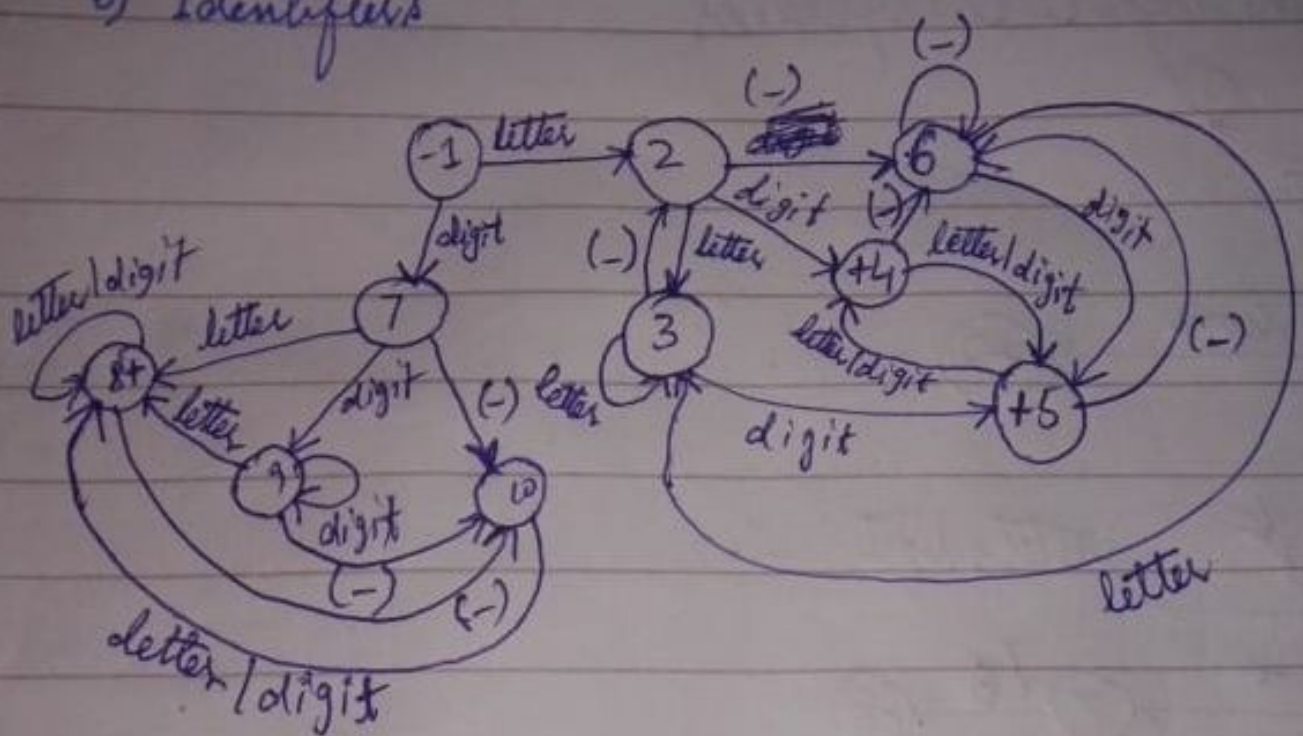
c) Number

d) Operator

States diagram (top): 1- , <, >, +2, +3, +4

!=, ==, :=, <>, *), /, +, -, ++, --, +=, -=, &&, &|; |&, ||
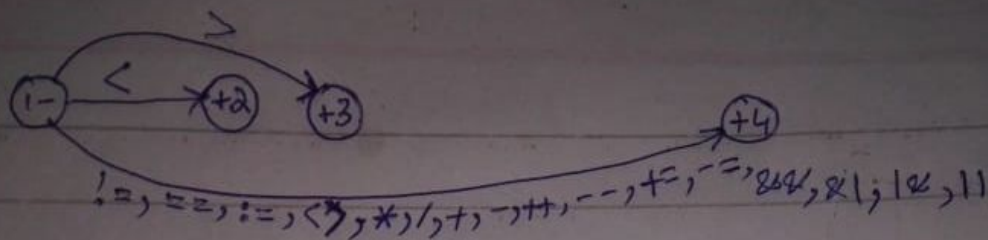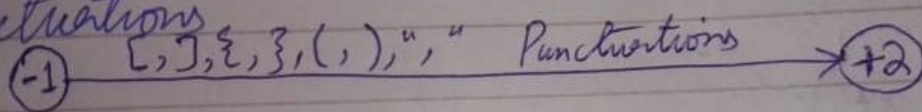
e) User Input & Operator And User Output & Operators

-1, <<<, 2+ User output and operators, +3, >>>

User Input and operator

F) Punctuations

-1, [,] , { , } , (,) , " , " Punctuations +2

g) Comments

-1, 2, +3, letter, digit, "_", +4, letter, digit, "_"

5, letter, digit, "_"

6, *, 7, /, +8

letter, digits "_"