

## "Postfix to Infix Conversion".

1. Which of the following data structure is used to convert postfix expression to infix expression?

- a) Stack
- b) Queue
- c) Linked List
- d) Heap

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Answer: a

Explanation: To convert the postfix expression into infix expression we need stack. We need stack to maintain the intermediate infix expressions. We use stack to hold operands.

2. The postfix expression  $abc+de/*-$  is equivalent to which of the following infix expression?

- a)  $abc+-de*/$
- b)  $(a+b)-d/e*c$
- c)  $a-(b+c)*(d/e)$
- d)  $abc+*-(d/e)$

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Answer: c

Explanation: Given postfix expression :  $abc+de/*-$

infix  $\Rightarrow a(b+c)(d/e)*-$

$\Rightarrow a(b+c)*(d/e)-$

$\Rightarrow a-(b+c)*(d/e)$

Hence, correct choice is  $a-(b+c)*(d/e)$ .

3. The equivalent infix expression and value for the postfix form  $1\ 2\ +\ 3\ *\ 4\ 5\ *\ -$  will be

- 
- a)  $1 + 2 * 3 - 4 * 5$  and -13
  - b)  $(2 + 1) * (3 - 4) * 5$  and 13
  - c)  $1 + 2 * (3 - 4) * 5$  and -11
  - d)  $(1 + 2) * 3 - (4 * 5)$  and -11

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Answer: d

Explanation: Given postfix expression :  $1\ 2\ +\ 3\ *\ 4\ 5\ *\ -$

$\Rightarrow (1 + 2) 3 * 4 5 * -$

$\Rightarrow ((1 + 2) * 3) 4 5 * -$

$\Rightarrow ((1 + 2) * 3) (4 * 5) -$

$$\Rightarrow ((1 + 2) * 3) - (4 * 5)$$

So, the equivalent infix expression is  $(1 + 2) * 3 - (4 * 5)$  and its value is -11.

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4. What is the value of the postfix expression  $2\ 3\ +\ 4\ 5\ 6\ -\ -\ *$

- a) 19
- b) 21
- c) -4
- d) 25

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Answer: d

Explanation: Given postfix expression :  $2\ 3\ +\ 4\ 5\ 6\ -\ -\ *$

infix  $\Rightarrow (2 + 3)4 (5 - 6) - *$

$\Rightarrow (2 + 3)*4 - (5 - 6)$

Hence, value =  $(2 + 3) * (4 - (5 - 6)) = 5 * (4 - (-1)) = 5*5 = 25$ .

5. The prefix expression of the postfix expression  $AB+CD-*$  is \_\_\_\_\_

- a)  $(A+B)*(C-D)$
- b)  $+AB*-CD$
- c)  $A+*BCD-$
- d)  $*+AB-CD$

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Answer: d

Explanation: To convert from postfix to prefix, we first convert it to infix and then to prefix.

postfix :  $AB+CD-*$

infix  $\Rightarrow (A+B) * (C-D)$

So, prefix  $\Rightarrow +AB*-CD,$

$\Rightarrow *+AB-CD.$

Therefore, correct choice is  $*+AB-CD$ .

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6. Consider the postfix expression  $4\ 5\ 6\ a\ b\ 7\ 8\ a\ c$ , where a, b, c are operators. Operator a has higher precedence over operators b and c. Operators b and c are right associative. Then, equivalent infix expression is

- a)  $4\ a\ 5\ 6\ b\ 7\ 8\ a\ c$
- b)  $4\ a\ 5\ c\ 6\ b\ 7\ a\ 8$
- c)  $4\ b\ 5\ a\ 6\ c\ 7\ a\ 8$
- d)  $4\ a\ 5\ b\ 6\ c\ 7\ a\ 8$

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Answer: c

Explanation: Given postfix expression: 4 5 6 a b 7 8 a c

infix  $\Rightarrow 4 (5 a 6) b (7 a 8) c$

$\Rightarrow (4 b (5 a 6)) (7 a 8) c$

$\Rightarrow (4 b (5 a 6)) c (7 a 8)$

So, the required infix expression is 4 b 5 a 6 c 7 a 8.

7. To convert the postfix expression into the infix expression we use stack and scan the postfix expression from left to right.

a) True

b) False

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Answer: a

Explanation: Stack is used to postfix expression to infix expression. And to convert we follow the following steps: (i) Scan the expression from left to right. (ii) If operand is found, push it on stack. (iii) If operator is found, the two operands are popped and the combined infix expression is formed and pushed onto the stack.

8. Which of the following is valid reverse polish expression?

a) a op b

b) op a b

c) a b op

d) both op a b and a b op

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Answer: c

Explanation: The postfix expression is also known as the reverse polish expression. In postfix expressions, the operators come after the operands. So, the correct expression is a b op and hence a b op is correct.

9. The result of the postfix expression 5 3 \* 9 + 6 / 8 4 / + is \_\_\_\_\_

a) 8

b) 6

c) 10

d) 9

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Answer: b

Explanation: Given postfix expression: 5 3 \* 9 + 6 / 8 4 / +

Result = 5 3 \* 9 + 6 / 8 4 / +

= (5 \* 3) 9 + 6 / (8 / 4) +

= ((5 \* 3) + 9) / 6 + (8 / 4) = (24 / 6) + 2 = 4 + 2 = 6.