**ABHINAV TYAGI (DESD HYD – 50330001)**

Q2. Evaluate the following Post-fix Expressions.

**a. 2,3,4,\*,+**

Solution:

Step1: Push 2 into stack.

|  |  |  |  |
| --- | --- | --- | --- |
| 2 |  |  |  |

Step2: Push 3 into stack.

|  |  |  |  |
| --- | --- | --- | --- |
| 2 | 3 |  |  |

Step3: Push 4 into stack

|  |  |  |  |
| --- | --- | --- | --- |
| 2 | 3 | 4 |  |

Step4: Pop 4 & 3 from the stack and use the operator \* as 3\*4 =12. Push 12 into it.

|  |  |  |  |
| --- | --- | --- | --- |
| 2 | 12 |  |  |

Step5: As one more operator comes again in the series. We will pop the elements 2 & 12 and will use the operator “+” as 2+12 =14. Push 14 into it.

|  |  |  |  |
| --- | --- | --- | --- |
| 14 |  |  |  |

b. **5, 1, 2 + 4 × + 3 –**

Solution:

Step1: Push 5 into stack.

|  |  |  |  |
| --- | --- | --- | --- |
| 5 |  |  |  |

Step2: Push 1 into stack.

|  |  |  |  |
| --- | --- | --- | --- |
| 5 | 1 |  |  |

Step3: Push 2 into stack

|  |  |  |  |
| --- | --- | --- | --- |
| 5 | 1 | 2 |  |

Step4: Pop 1 & 2 from the stack and use the operator “+” as 1+2 =3. Push 3 into it.

|  |  |  |  |
| --- | --- | --- | --- |
| 5 | 3 |  |  |

Step5: Push 4 into stack.

|  |  |  |  |
| --- | --- | --- | --- |
| 5 | 3 | 4 |  |

Step6: As one more operator comes again in the series. We will pop the elements 3 & 4 and will use the operator “\*” as 3\*4 =12. Push 12 into it.

|  |  |  |  |
| --- | --- | --- | --- |
| 5 | 12 |  |  |

Step7: As one more operator comes again in the series. We will pop the elements 5 & 12 and will use the operator “+” as 5+12 =17. Push 17 into it.

|  |  |  |  |
| --- | --- | --- | --- |
| 17 |  |  |  |

Step8: Push 3 into stack.

|  |  |  |  |
| --- | --- | --- | --- |
| 17 | 3 |  |  |

Step9: As “-” operator comes in the series. We will pop the elements 17 & 3 and will use the operator “-” as 17-3 =14. Push 14 into it.

|  |  |  |  |
| --- | --- | --- | --- |
| 14 |  |  |  |

**c. 3, 4, 2 + \***

Solution:

Step1: Push 3 into stack.

|  |  |  |  |
| --- | --- | --- | --- |
| 3 |  |  |  |

Step2: Push 4 into stack.

|  |  |  |  |
| --- | --- | --- | --- |
| 3 | 4 |  |  |

Step3: Push 2 into stack

|  |  |  |  |
| --- | --- | --- | --- |
| 3 | 4 | 2 |  |

Step4: Pop 4 & 2 from the stack and use the operator + as 4+2 =6. Push 6 into it.

|  |  |  |  |
| --- | --- | --- | --- |
| 3 | 6 |  |  |

Step5: As “\*” operator comes again in the series. We will pop the elements 3 & 6 and will use the operator “\*” as 3\*6 =18. Push 18 into it.

|  |  |  |  |
| --- | --- | --- | --- |
| 18 |  |  |  |

**d. 3, 4, \*, 2, 5, \*, +, \***

Solution:

Step1: Push 3 into stack.

|  |  |  |  |
| --- | --- | --- | --- |
| 3 |  |  |  |

Step2: Push 4 into stack.

|  |  |  |  |
| --- | --- | --- | --- |
| 3 | 4 |  |  |

Step3: Pop 3 & 4 from the stack and use the operator “\*” as 3\*4 =12. Push 12 into it.

|  |  |  |  |
| --- | --- | --- | --- |
| 12 |  |  |  |

Step4: Push 2 into Stack.

|  |  |  |  |
| --- | --- | --- | --- |
| 12 | 2 |  |  |

Step5: Push 5 into Stack.

|  |  |  |  |
| --- | --- | --- | --- |
| 12 | 2 | 5 |  |

Step6: As “\*” operator comes in the series. We will pop the elements 2 & 5 and will use the operator “\*” as 2\*5 =10. Push 10 into it.

|  |  |  |  |
| --- | --- | --- | --- |
| 12 | 10 |  |  |

Step7: As “+” operator comes in the series. We will pop the elements 12 & 10 and will use the operator “+” as 12+10 =22. Push 22 into it.

|  |  |  |  |
| --- | --- | --- | --- |
| 22 |  |  |  |

**e. 7, 8 ,+, 3, 2, +, /**

Solution:

Step1: Push 7 into stack.

|  |  |  |  |
| --- | --- | --- | --- |
| 7 |  |  |  |

Step2: Push 8 into stack.

|  |  |  |  |
| --- | --- | --- | --- |
| 7 | 8 |  |  |

Step3: Pop 7 & 8 from the stack and use the operator + as 7+8 =15. Push 15 into it.

|  |  |  |  |
| --- | --- | --- | --- |
| 15 |  |  |  |

Step4: Push 3 into stack.

|  |  |  |  |
| --- | --- | --- | --- |
| 15 | 3 |  |  |

Step5: Push 2 into stack.

|  |  |  |  |
| --- | --- | --- | --- |
| 15 | 3 | 2 |  |

Step6: Pop 3 & 2 from the stack and use the operator “+” as 3+2 =5. Push 5 into it.

|  |  |  |  |
| --- | --- | --- | --- |
| 15 | 5 |  |  |

Step7: Pop 15 & 5 from the stack and use the operator “/” as 15/5 =3. Push 3 into it.

|  |  |  |  |
| --- | --- | --- | --- |
| 3 |  |  |  |