Data Structure
STACKS AND QUEUES

DPP-02

[MCQ]

1. Consider the following infix expression:
P-Q/(R*S)+T*U
The prefix notation of the given expression is-
(a) -+P/Q*RS*TU (b) +-P/Q*RS*TU
(c) +-/PQ*RS*TU (d) None of the above.

[MCQ]

2. Consider the following expression:
P+Q/R-S*T^U/V-W
The post fix notation of the given expression is-
(a) PQR/+STU^*V/-W-
(b) PQ+RS-TU^*V/-W-
(c) PQR/-STU^*V/W+-
(d) None of the above

[MCQ]

3. Consider the following prefix notation:
/^*+abc/de^gh
The postfix notation of the given expression is-
(a) ab+c*de/^gh^/
(b) abc+*de/^gh^/
(c) abc+de/*^gh^/
(d) None of the above

[NAT]

4. Consider the following infix expression:
P+Q/R-S*T^U/V-W
The maximum size of the operator stack required to convert the given infix to postfix notation is _____.

[MCQ]

5. Consider the following infix expression:
P*Q/R-S*T+U/V*W
On reaching the symbol V, the top two contents of the operator stack are:
(a) /, * (b) /, -
(c) *, + (d) /, +

[NAT]

6. Consider the following postfix expression:
8 2 3 ^/ 5 3 *+ 2 1 / -
The result of evaluating the above postfix expression is _____.

[NAT]

7. Let X be the result when the below postfix expression is evaluated:
X = 8 3 1 + - 2 ^ 7 1 2 - * +
And Y be the result of the following postfix expression:
Y= X 3 / 4 +
The value of $(X+Y)^{0.5}$ is _____

[NAT]

8. Let X be the result when the below postfix expression is evaluated:
X = 4 5 1 + * 2 / 3 1 2 + * +
Let Y be the maximum size of the operand stack, the value of X-Y is _____

Answer Key

1. **(b)**
2. **(a)**
3. **(a)**
4. **(3)**
5. **(d)**
6. **(14)**
7. **(4)**
8. **(17)**

Hints and Solutions

1. (b)

P-Q/(R*S)+T*U
P-Q/*RS+T*U
P-/Q*RS+*TU
-P/Q*RS+*TU
+-P/Q*RS*TU

2. (a)

P+Q/R-S*T^U/V-W
P+Q/R-S*TU^/V-W
P+QR/-S*TU^/V-W
P+QR/-STU^*/V-W
P+QR/-STU^*V/-W
PQR/+-STU^*V/-W
PQR/+STU^*V/--W
PQR/+STU^*V/-W-

3. (a)

/^*+abc/de^gh
/^*+abc/degh^
/^*+abcde/gh^
/^*ab+ c de/ gh^
/^ab+c* de/ gh^
/ ab+c*de/^ gh^
ab+c*de/^gh^/

4. (3)

^
/ * /
+ - -

Postfix notation: PQR/+STU^*V/-W-

5. (d)

* /
* / - +

Post fix notation till symbol V is encountered: PQ*R/ST*-UV

The top two contents of the stack are - /, +

6. (14)

3	3	1			
2	8	5	15	2	2
8		1		16	14

PUSH(8);
PUSH(2);
PUSH(3);
^ is encountered. Pop(3), Pop(2)
PUSH(2^3) i.e PUSH(8)
/ is encountered. Pop(8), Pop(8)
PUSH(8/8) i.e PUSH(1);
PUSH(5);
PUSH(3);
* is encountered. Pop(3), Pop(5)
PUSH(5*3) i.e PUSH(15)
+ is encountered. Pop(15), Pop(1)
PUSH(1+15) i.e PUSH(16)
PUSH(2);
PUSH(1);
/ is encountered. Pop(1), Pop(2)
PUSH(2/1) i.e PUSH(2);
- is encountered. Pop(2), Pop(16)
PUSH(16-2) i.e PUSH(14);
Final Result is 14. It is available in the stack.

7. (4)

8 3 1 + - 2 ^ 7 1 2 - * +
8 4 - 2 ^ 7 1 2 - * +
4 2 ^ 7 1 2 - * +
16 7 1 2 - * +
16 7 -1*+
16 -7 +
X = 9
Y = 9 3 / 4 +
Y = 3 4 +
Y = 7
$(X+Y)^{0.5} = 16^{0.5} = 4$

8. (17)

				2				
1				1	3			
5	6	2		3		9		
4			24	12			21	

X= 21, Y=4, X-Y=17