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Data Structure

Assignment -2

Q1

(a) A+B-C

Polish Notation : +A-BC

Reverse Polish : AB+C-

Polish : (C-B+A)

Expression	Stack	Prefix
C	(	C
C	(	C
-	(-	CB
B	(-	CB-
+	(+	CB-A
A	(+	CB-A+ ⇒ +A-BC
)		

Revese Polish : (A+B-C)

Expression	Stack	Prefix
(	(	
A	(	A
+	(+	A
B	(+	AB
-	(-	AB+
C	(-	AB+C
)		AB+C-

(b) $(A+B) * (C-D) \$ E*F$

Polish : $(F*E\$(D-C)*(B+A))$

Expression	Stack	Prefix
(	(	
F	(	F
*	(*	FE
E	(*	FE
$	(*$	FED
(	(*$(	FED
D	(*$(	FEDC
-	(*$(-	FEDC
C	(*$(-	FEDC-$*
)	(*$	FEDC-$*
*	(*	FEDC-$*B
B	(*	FEDC-$*B
+	(*(	FEDC-$*BA
A	(*(+	FEDC-$*BA+
)	(*	FEDC-$*BA+*
)		

$\Rightarrow$ *+AB*$-CDEF

Reverse Polish : $(CA+D) * (C-D) \$ E*F)$

Expression	Stack	Postfix
(	(	
(	((	
A	((	A
+	((+	A
B	(	AB+
)	(	AB+

*	C*	AB+
C	C*C	AB+
C	C*C	AB+C
-	C*C-	AB+C
D	C*C-	AB+CD
)	C*	AB+CD-
$	C*$	AB+CD-
E	C*$	AB+CD-E
+	C*	AB+CD-E
F	C*	AB+CD-E$*F
)		AB+CD-E$*F*

$\Rightarrow$ AB+CD-E$*F*

(C) A+((B-C)*(D-E)+F)/G)$(H-J)

Polish: ((J-H)$(G/(F+(E-D)*(C-B)))+A)

Expression	Stack	Profix
(	(	
(	((	
J	((	J
-	((-	J
H	(	JH
)	($	JH-
G	($C	JH-
/	($C/	JH-
C	($C/C	JH-G
F	($C/C+	JH-G
+	($C/C+C	JH-G
C	($C/C+C	JH-GF
		JH-GFE

-	C$C/C+C-	JHGFE
D	"	JH-GFED
)	C$C/C+	JH-GFED-
*	C$C/C+*	"
C	C$C/C+*C	"
(	C$C/C+*C	JH-GED-C
-	C$C/C+*C-	"
B	"	"
)	C$C/C+*	JH-GFED-CB
)	C$C+	JH-GFED-CB-
)		JH-GFED-CB-*+
+	C$	JH-GFED-CB-*+
A	C+	JH-GFED-CB-*+/$
C	C+	JH-GFED-CB-+/$A

=> +A$/+*-BC-DEFG-HJ

Q2

(i) In storing internet browser history recent searches are added from front and best ones are removed from rear.

(ii) In implementation of tasks for several processors. New processors are added from the ~~front~~ rear of the degree. When the degue of one processor becomes empty it starts taking from the rear of other.

(iii) Also used in palindrome checker.

Q3

200 + 5×4 + 1×4 = 224

Q4

1000 + 7×2×9 + 2×8 + 1×4 = 1150

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Q5 (i) (A+(B^C)*D-E)

Expression	stack	Postfix
(	(	
A	(	A
+	(+	AB
B	(+	AB
^	(+^	AB
C	(+^	ABC
)	(+	ABC^
*	(+*	ABC^D
D	(+*	ABC^D*
-	(-	ABC^D*+
E	(-	ABC^D*+E
)		ABC^D*+E-

⇒ ABC^D*+E-

Q6

(i) 15, 8, 2, -, *, 3, 4, 5, +, *, -

= 117

Q7

Ans

```
void fun (int size, Node * head)
{
    struct Node * temp = head;
    int x,
    if (size % 2 == 0)
        x = size/2;
    else
```

```
x = size/2 + 1;
while (x-- > 0)
{
    temp = temp -> next;
}
printf("%d", temp -> data);
}
```

Q8

(a) ++a - *$bcd/+ef*ghi

(a + (b$c)) * d - (e+f) / (g*h)) + i

(b) abcde - + $ * ef * -

(f * e) - ((e - d) + c) $ b) * a

Q9

(a) AB + C - BA + C$ -

((A+B) - C) - ((B+A) $ C)

(b) ABC + * CBA - + *

(A * (B+C)) * (C + (B-A)) = 15