Problem statement : Consider the following data structures as input to PassII of a two pass Macro Pre-processor. Show the contents of APTAB and expanded code for each Macro Call given below :

1)Input data structures (MNT, KPDTAB, MDT)

a)MNT

MNT Index	Name of Macro	#PP	#KP	MDTP	KPDTP
1	INCR	3	0	1	------------
2	INCR_M	0	3	5	1
3	INCR_D	0	3	9	4

b)KPDTAB

1	MEM_VAL	-----------
2	INCR_VAL	-----------
3	REG	-----------
4	MEM_VAL	-----------
5	INCR_VAL	-----------
6	REG	AREG

c)MDT

1	MOVER (P,3), (P,1)
2	ADD (P,3), (P,2)
3	MOVEM (P,3), (P,1)
4	MEND
5	MOVER (P,3), (P,1)
6	ADD (P,3), (P,2)
7	MOVEM (P,3), (P,1)
8	MEND
9	MOVER (P,3), (P,1)
10	ADD (P,3), (P,2)
11	MOVEM (P,3), (P,1)
12	MEND

2)Macro Calls

 a) INCR A, B,AREG
 b) INCR_M MEM_VAL=A, INCR_VAL=B, REG=AREG
c) INCR_M INCR_VAL=B, REG=AREG, MEM_VAL=A
d) INCR_D MEM_VAL=A, INCR_VAL=B
e) INCR_D INCR_VAL=B, MEM_VAL=A
f) INCR_D INCR_VAL=B, MEM_VAL=A, REG=BREG

Solution

a)INCR A, B,AREG

APTAB

1	A
2	B
3	AREG

Expanded Code
+ MOVER AREG, A
+ ADD   AREG, B
+ MOVEM AREG, A

b) INCR_M MEM_VAL=A, INCR_VAL=B, REG=AREG

APTAB

1	A
2	B
3	AREG

Expanded Code
+ MOVER AREG, A
+ ADD   AREG, B
+ MOVEM AREG, A

c) INCR_M INCR_VAL=B, REG=AREG, MEM_VAL=A

APTAB

1	A
2	B
3	AREG

Expanded Code
+ MOVER AREG, A
+ ADD   AREG, B
+ MOVEM AREG, A

d) INCR_D MEM_VAL=A, INCR_VAL=B

APTAB

1	A
2	B
3	AREG

Expanded Code
+ MOVER AREG, A
+ ADD   AREG, B
+ MOVEM AREG, A

e) INCR_D INCR_VAL=B, MEM_VAL=A

APTAB

1	A
2	B
3	AREG

Expanded Code
+ MOVER AREG, A
+ ADD   AREG, B
+ MOVEM AREG, A

f) INCR_D INCR_VAL=B, MEM_VAL=A, REG=BREG

APTAB

1	A
2	B
3	BREG

Expanded Code
+ MOVER BREG, A
+ ADD   BREG, B
+ MOVEM BREG, A