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Assignment No. 1

Que.2] For the following Assembly language code, show contents of symbol, Literal, and pool table. Also generate intermediate and Machine code.

Assembly code -

```
                                    LC
        Start   1000                ↓
        Read    N                   1000
        MOVER   B = '1'             1001
        MOVEM   B , TERM            1002
AGAIN   MUL     B , TERM            1003
        MOVER   C , TERM            1004
        COMP    C , N               1005
        BC      LE, AGAIN           1006
        MOVEM   B , RESULT          1007
        LTORG                       1⇒1008
        PRINT   RESULT              1009
        STOP                        1010
N       DS      1                   1011
RESULT  DS      20                  1012
TERM    DS      1                   1013
        END
```

Symbol Table -

Index	Symbol	LC
0	N	1011
1	TERM	1013
2	AGAIN	1003
3	RESULT	1012

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Literal Table -

Index	Literal	LC
0	1	1008

Pool Table

Literal No.
0
1

Intermediate Code -

	Assembly Program	LC	Intermediate code
	START 1000	1000	(AD,01) (C,1000)
	Read N	1000	(IS,09) (S,0)
	MOVER B = '1'	1001	(IS,04) (RG,02) (L,0)
	MOVEM B, TERM	1002	(IS,05) (RG,02) (S,1)
AGAIN	MUL B, TERM	1003	(IS,03) (RG,02) (S,1)
	MOVER C, TERM	1004	(IS,04) (RG,03) (S,1)
	COMP C, N	1005	(IS,06) (RG,03) (S,0)
	BC, LE, AGAIN	1006	(IS,07) (CC,03) (S,2)
	MOVEM B, RESULT	1007	(IS,05) (RG,02) (S,3)
	LTORG	1008	(DL,02) (C,1)
	PRINT RESULT	1009	(IS,10) (S,3)
	STOP	1010	(IS,00)
N	DS 1	1011	(AD,02)
RESULT	DS 20	1012	(AD,02)
TERM	DS 1	1013	(AD,02)
	END		

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Machine Code -

Intermediate code	LC	Machine code.
(AD,01)(C,1000)	1000	-
(IS,09)(S,0)	1000	09 1011
(IS,04)(RG,02)(L,0)	1001	04 02 1008
(IS,05)(RG,02)(S,1)	1002	05 02 1013
(IS,03)(RG,02)(S,1)	1003	03 02 1013
(IS,04)(RG,03)(S,1)	1004	04 03 1013
(IS,06)(RG,03)(S,0)	1005	06 03 1011
(IS,07)(CC,03)(S,2)	1006	07 03 1003
(IS,05)(RG,02)(S,3)	1007	05 02 1012
(DL,02)(C,1)	1008	-
(IS,10)(S,3)	1009	10 1012
(IS,00)	1010	-
(AD,02)	1011	-
(AD,02)	1012	-
(AD,02)	1013	-

Que.2] For the following assembly language code
a) Show contents of MNT, MDT & ALA
b) Show intermediate code generated for program after pass-I of macropro.

```
MAC     START   100
        MACRO
&A0     ADD1    &A1,&A2,&A3
        L       1,&A1
        L       2,&A2
        AR      1,2
```

```
        MUL     1,&A3
        ST      N,1
        MEND
        MACRO
        SUB     &P1,&P2
        L       1,&P1
        S       1,&P2
        ST      2,1
        MEND
TOTAL   EQU     5
        L       1,D1
        SR      2,2
        A       1,=F'5'
        ADD1    LOOP1,D1,D2,D3
        ST      2,1
        AR      TOTAL,2
        SUB     X,Y
        BR      14
D1      DC      F'3'
D2      DC      F'45'
D3      DC      F'21'
X       DC      F'10'
Y       DC      F'20'
        END
```

Macro Name Table (MNT) -

MNTC	Macro Name	MDTC
1	ADD1	1
2	SUB	8

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Macro Definition Table (MDT)-

MDTC	Macro Card.
1	&A0 ADD1 &A1 &A2 &A3
2	#1 L 1,#2
3	L 2,#3
4	AR 1,2
5	MUL 1,#4
6	ST 1,N,1
7	MEND
8	SUB &P1,&P2
9	L 1,#5
10	S 1,#6
11	ST 1,2
12	MEND

Argument Array List (ALA)-

Index	Argument	Actual Arg.
1	&A0	-
2	&A1	D1
3	&A2	D2
4	&A3	D3
5	&P1	X
6	&P2	Y

Intermediate Code after Pass-I:

```
MAC START 100
TOTAL EQU 5
      L   1,D1
      SR  2,2
```

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```
        A     4,F='5'
        ADDI  LOOP1,D1,D2,D3
        ST    2,1
        AR    TOTAL-2
        SUB   X,Y
        BR    1,4
D1      DC    F='3'
D2      DC    F='45'
D3      DC    F='21'
P1      DC    F='10'
D2      DC    F='20'
        END
```