Binary addition using 2's complement :-

(i) Add 26 and 12 (ii) add 26 and (−12)

(iii) Add −26 and 12 (iv) Add −26 and −(12)

(i) 26 → 011010

12 → 01100

$$\begin{array}{r} 0\overset{1}{1}1010 \\ +\ 001100 \\ \hline 100110 \end{array}$$ (38)

Ans.

26 — 011010

−(12) — 01100

1 0 0 1 1 — 1's comp.

+1

(−12) → 10100 — 2's complement of (12)

Now (26) → 0 0 1 1 0 1 0

(−12) → 1 0 1 0 0

1 0 0 1 1 1 0

discard

Ans- is 001110

MJC-9.

−26 and 12.

26 → 0 1 1 0 1 0

1 0 0 1 0 1 — 1's comp.

+ 1

1 0 0 1 1 0 — 2's complement of 26

1 1 0 0 1 1 0 ⇒ (−26)

0 0 0 1 1 0 0 ⇒ (12)

1 1 1 0 0 1 0 (−14)

0 0 0 1 1 0 1 — 1's compl.

+ 1

0 0 0 1 1 1 0 (14) Ans

(IV) (−26) + (−12)

26 → 0 1 1 0 1 0

12 → 0 1 1 0 0

26 → 0 1 1 0 1 0

1 0 0 1 0 1 — 1's comp.

+ 1

1 0 0 1 1 0 — 2's comp.

12 → 0 1 1 0 0

1 0 0 1 1 (1's

+ 1

1 0 1 0 0 (2's

Now mJC-9.

$$\begin{array}{r} 1\ 1\ 0\ 1\ 1\ 0 \\ 1\ 0\ 1\ 0\ 0 \\ \hline 1\ 0\ 1\ 1\ 0\ 1\ 0 \end{array}$$

(−26) 2's ⇒ (−12) 2's

discard.

1 0 1 1 0 1 0 ⇒ (−36)

0 1 0 0 1 0 1 — 1's complement

+1

0 1 0 0 1 1 0 → +36

Q. Add 14 and −5

14 → 0 1 1 1 0

5 → 0 1 0 1

1 0 1 0 — 1's complement.

+1

1 0 1 1 2's complement.

Now

14 → 0 1 1 1 0

(−5) → 1 0 1 1

1 0 1 0 0 1

discard.

(+9) → 0 1 0 0 1 Ans