Answer To the Question No 1

(a) Congruences: $x \equiv 1 \pmod 3$, $x \equiv 2 \pmod 5$, $x \equiv 3 \pmod 7$.

$N = 3 \cdot 5 \cdot 7 = 105$

a_i	n_i	$N_i = N/n_i$	$N_i^{-1} \pmod{n_i}$	term $a_i N_i N_i^{-1}$
1	3	35	2	70
2	5	21	1	42
3	7	15	1	45

Sum $\equiv 70 + 42 + 45 \equiv 157 \equiv 52 \pmod{105}$

$\therefore x \equiv 52 \pmod{105}$

(b) Congruences: $x \equiv 5 \pmod{11}$, $x \equiv 14 \pmod{29}$, $x \equiv 15 \pmod{31}$

$N = 11 \cdot 29 \cdot 31 = 9889$

a_i	n_i	$N_i =$	$N_i^{-1} \pmod{n_i}$	term
5	11	899	7	31465
14	19	341	4	19096
15	31	319	7	33495

Sum: $31465 + 19096 + 33495 = 84056 \equiv 4944 \pmod{\ }$

$\therefore x \equiv 4944 \pmod{9889}$

(c) Congruences: $x \equiv 5 \pmod{6}$, $x \equiv 4 \pmod{11}$,

$x \equiv 3 \pmod{17}$

$N = 6 \cdot 11 \cdot 17 = 1122$

a_i	n_i	N_i	$N_i^{-1} \pmod{n_i}$	term
5	6	187	1	935
4	11	102	4	1632
3	17	66	8	1584

$\text{Sum} = 935 + 1632 + 1584 = 4151 \equiv 785 \pmod{1122}$

$\therefore x \equiv 785 \pmod{1122}$