Sultan Aliilyasa
1708122 20066.

Quis Mardisk 1 27/09/2022

1.a. $x \equiv 12 \pmod{25}$ → P(1)
$x \equiv 9 \pmod{26}$ → P(2)
$x \equiv 23 \pmod{27}$ → P(3)

(1)
$x \equiv 12 \pmod{25}$
$x = 12 + 25q$

(2)
$x \equiv 9 \pmod{26}$
$\therefore (12 + 25q) \equiv 9 \pmod{26}$
$\therefore 25a = -3 \pmod{26}$
$\therefore 25a \equiv 23 \pmod{26}$

$25^{-1} \equiv 25 \pmod{26}$
$\therefore 25 \times 25a \equiv 25 \times 23 \pmod{26}$
$\therefore 625a = 575 \pmod{26}$
$\therefore a \equiv 3 \pmod{26}$

$a = 3 + 26b.$

$x = 12 + 25q$
$x = 12 + 25(3 + 26b)$
$x = 12 + 75 + 650b$
$x = 87 + 650b$

(3) $x \equiv 23 \pmod{27}$
$\therefore (87 + 650b) \equiv 23 \pmod{27}$
$\therefore 86 + 2b \equiv 23 \pmod{27}$
$\therefore 2b \equiv 17 \pmod{27}$

$2^{-1} \equiv 14 \pmod{27}$
$\therefore 14 \times 2b \equiv 14 \times 17 \pmod{27}$
$\therefore 28b \equiv 238 \pmod{27}$
$\therefore b \equiv 22 \pmod{27}$

$b = 22 + 27c$

→ $x = 87 + 650b$
$x = 87 + 650(22 + 27c)$
$x = 87 + 14300 + 17550c$
$x = 14387 + 17550c$
$x \equiv 14387 \pmod{17550}$ //

Sultan Ali Ilyasa
140810210066

Quiz 1 Matdisk

1.

1.B. $3125^{-1} \bmod 9987$

$9987 = 3125(3) + 612 \rightarrow 612 = 9987 - 3125(3)$
$3125 = 612(5) + 65 \rightarrow 65 = 3125 - 612(5)$
$612 = 65(9) + 27 \rightarrow 27 = 612 - 65(9)$
$65 = 27(2) + 11 \rightarrow 11 = 65 - 27(2)$
$27 = 11(2) + 5 \Rightarrow 5 = 27 - 11(2)$
$11 = 5(2) + 1 \rightarrow 1 = 11 - 5(2)$

$1 = 11 - 5(2)$
$1 = 11 - 2(27 - 11(2))$
$1 = 11(5) - 2(27)$
$1 = 5(65 - 27(2)) - 2(27)$
$1 = 5(65) - 12(27)$
$1 = 113(65) - 12(612)$
$1 = 113(65) - 12(612)$
$1 = 113(3125) - 577(612)$
$1 = 1849(3125) - 577(9987)$
$1849(3125) - 577(9987) = 1$
$1849(3125) = 1 \pmod{9987}$
$\therefore 3125^{-1} \bmod 9987 = 1849$ //

1.C $\gcd(9888, 6060)$

$9888 = 6060(1) + 3828$
$6060 = 3828(1) + 2232$
$3828 = 2232(1) + 1596$
$2232 = 1596(1) + 636$
$1596 = 636(2) + 324$
$636 = 324(1) + 312$
$324 = 312(1) + 12$
$312 = 12(26) + 0$
$\rightarrow \gcd(9888, 6060) = 12$

② a) $n = \{A, B, C, D, E, F, G, H, I, J\}$

R	A	B	C	D	E	F	G	H	I	J
A	1	1	0	1	1	0	0	1	1	0
B	1	1	0	1	1	0	0	1	1	0
C	0	0	1	0	0	0	0	0	0	0
D	1	1	0	1	1	0	0	1	1	0
E	1	1	0	1	1	0	D	1	1	0
F	0	0	0	0	0	1	1	0	0	1
G	0	0	0	0	0	1	1	0	0	1
H	1	1	0	1	1	0	0	1	1	0
I	1	1	0	1	1	0	0	1	1	0
J	0	0	0	0	0	1	1	0	0	1

b) → R Refleks karena (A,A), (B,B), ... (J,J) anggota semisal
→ R Simetri karena (A,B)(B,A), ... semua pasangan terbaliknya anggota relasi
→ R transitif karena (A,B), (B,D) dan (A,D) anggota relasi

③ a) maximal elements
↳ {L, M}

b) Minimal elements
↳ {a, b, c}

c) Greatest element
↳ { }

d) Least element
↳ { }

e) Upper bounds {a, b, c}
↳ {i, k, m}

f) Least upper bound of {a, b, c}
↳ {k}

g) Lower bounds of {f, g, h}
↳ { } tidak ada

h) greatest bounds of {f, g, h}
↳ { } tidak ada

4.A. 1) x adalah Integer

$\lceil x \rceil - \lfloor x \rfloor = x - x = 0$

2) x bukan Integer

Misal $\lfloor x \rfloor = n$, $n < x < n+1$

Misal $\lceil x \rceil = m$, $m-1 < x < m$

Maka:

$(m-1) + (n-1) < x - x < m - n$

$m - n - 2 < 0 < m - n$

$\lceil x \rceil - \lfloor x \rfloor - 2 < 0 < \lceil x \rceil - \lfloor x \rfloor$

$0 < \lceil x \rceil - \lfloor x \rfloor < 2$

Karena $\lceil x \rceil - \lfloor x \rfloor$ adalah Integer, $\lceil x \rceil - \lfloor x \rfloor = 1$

Maka, $\lceil x \rceil - \lfloor x \rfloor = \begin{cases} 0, & x \in \mathbb{Z} \\ 1, & x \notin \mathbb{Z} \end{cases}$

4.B