

Problem Sheet 1 Number Systems

$$\begin{aligned} \text{Q1)} \quad & 2^3 \times 3^3 \times 7 \\ & 2^2 \times 3^2 \times 5^3 \times 11 \\ & 2^3 \times 3 \times 7^3 \\ & 2 \times 3 \times 5^2 \times 11^2 \times 13 \end{aligned}$$

$$\begin{aligned} \text{Q2)} \quad & 2 \\ & 6 \\ & 18 \\ & 154 \end{aligned}$$

$$\begin{aligned} \text{Q3)} \quad & 48, 96 \\ & 5, 720 \\ & 11, 363 \end{aligned}$$

$$\text{Q4)} \quad \text{lcf} = 4 \quad m = 206 \quad n = -1$$

$$\text{Q5)} \quad \text{lcf} = 4 \quad m = 341 \quad n = -27$$

$$\begin{aligned} \text{Q7)} \quad & 3 \bmod 7 \\ & 3 \bmod 8 \end{aligned}$$

$$\begin{aligned} \text{Q8)} \quad & 6 \bmod 7 \\ & 9 \bmod 13 \end{aligned}$$

$$\begin{aligned} \text{Q9)} \quad & 5^{-1} = 3 \bmod 7 \\ & 6^{-1} = 6 \bmod 7 \end{aligned}$$

$$\begin{aligned} \text{Q10)} \quad & 23^{-1} = 53 \text{ in } \mathbb{Z}_{58}^* \\ & 41^{-1} = 59 \text{ in } \mathbb{Z}_{93}^* \end{aligned}$$

Q11) $\gcd = 33$
 $x = 19 \quad y = -7$

Q12) DRSC VOMDEBO SC TECD
LBSVVSKXD

Q13) I AM A FOOL