

SAMPLE PAPER 2: PAPER 1

QUESTION 4 (25 MARKS)

Question 4 (a)

A prime number (or a prime) is a natural number greater than 1 that has no positive divisors other than 1 and itself.

List: 2, 3, 5, 7, 11, 13, 17

Question 4 (b)

Proper divisors of 6: 1, 2, 3

Proper divisors of 18: 1, 2, 3, 6, 9

$$\begin{array}{r|l} 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

Question 4 (c)

$6 = 3 + 2 + 1$ (Perfect number)

$18 \neq 1 + 2 + 3 + 6 + 9$

Question 4 (d)

$$n = 2^{p-1}(2^p - 1)$$

$$p = 2:$$

$$n = 2^1(2^2 - 1) = 2(3) = 6$$

$$6 = 1 + 2 + 3$$

$$n = 2^{p-1}(2^p - 1)$$

$$p = 3:$$

$$n = 2^2(2^3 - 1) = 4(8 - 1) = 4(7) = 28$$

$$\begin{array}{r|l} 2 & 28 \\ \hline 2 & 14 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

Proper divisors of 28: 1, 2, 4, 7, 14

$$28 = 1 + 2 + 4 + 7 + 14$$
