Task 5: $M = k \cdot T^b$

5.1) I. $100\,000 = k \cdot 10^b$

II. $30\,000 = k \cdot 1^b$

$\Rightarrow k \approx 21{,}87 \quad b \approx 0{,}523$

$\Rightarrow M = 21{,}87 \cdot T^{0{,}523}$

5.2) $M = 21{,}87 \cdot 16^{0{,}523}$

$M \approx 1\,113\,906{,}615$

Task 6: $cf_a = cf_1$

$cf_2 = cf_b = \frac{1}{2} cf_a$

$cf_3 = cf_c = \frac{1}{3} cf_a$

$cf_4 = cf_d = \frac{1}{4} cf_a$

$cf_1 + cf_2 + cf_3 + cf_4 = 6000$

$\rightsquigarrow cf_1 + \frac{1}{2} cf_1 + \frac{1}{3} cf_1 + \frac{1}{4} cf_1 = 6000$

$\rightsquigarrow \frac{12}{12} cf_1 + \frac{6}{12} cf_1 + \frac{4}{12} cf_1 + \frac{3}{12} cf_1 = 6000$

$\rightsquigarrow \frac{25}{12} cf_1 = 6000 \rightsquigarrow cf_1 = 2880$

$\rightsquigarrow cf_2 = 1440$

$\rightsquigarrow cf_3 = 960$

$\rightsquigarrow cf_4 = 720$

Task 7: 1, 2, 4, 8, 16, 32, 64, 128, 256

VB-Code:

$217_{10} = (128 + 64 + 16 + 8 + 1)_{10} = 11011001_2$

VB: 0000 0001 1101 1001

γ-code:

offset: 101 1001

length: 11111110

⇒ γ-code: 111 11110 101 1001

Task 8:

1111010000 111110 101011000

length offset | length offset | offset | length offset

0 missing?

⇒ 11000 110101 100 ⇒ 48 105 4

Gapsequenced

postings sequence:

docIDs	48	153	157
gaps	48	105	4