$n = 15$ splits $r = 10$ segments $j = 3$ term partitions

Size of split $= \frac{800\,MB}{15}$

Map phase : 10 M/cs

Time spent by M/c $= \frac{800}{15} \times 10^6 (10^{-8} + 10^{-8})$ s/byte
(reading) (comparison)

$= 0.53 + 0.53$

$= 1.068$

Time to parse (Two phases) $=$ **2.12 sec**

Reduce Phase

No. of postings / inverter $= \frac{10^8}{3}$

Inverter : Time spent in reading $= \frac{800}{3} \times 10^6 \times 10^{-8}$ s/byte

$= 2.6$ sec.

Time spent in Sorting (T $\log_2$ T comparisons) $= \left(\frac{10^8}{3} \times \log_2 \frac{10^8}{3}\right) \times 10^{-8}$

$8.33 \times 10^8 \times 10^{-8}$

$= 8.33$ sec.

Size of index $= \left(\frac{4 \times 10^5}{3} \times 4\right) + \left(\frac{10^8}{3} \times 4\right)$

$= 533333.33 + 133333333.33$

$= 13.38 \times 10^7$

Time spent in writing $= 13.38 \times 10^7 \times 10^{-8} =$ **1.338**

Total Time $= 2.12 + 2.6 + 8.3 + 1.338$

$= 14.32$ sec.