1. Capacity of each track $= 512 \times 1$ Mb
$= 512$ Mb

Data transfer rate $= 12 \times 512 \times \frac{7200}{60}$ Mbps

$\therefore$ Transfer time $= \frac{512 \times 8 \text{ Mb}}{12 \times 512 \times 120 \text{ Mbps}}$

$= 5.55$ ms

Rotational latency $= \frac{60}{7200 \times 2}$

$= 4.167$ ms

$\therefore$ Avg access time $= (10 + 5.55 + 4.167)$ ms

$= 19.717$ ms

2. Let the block size be n.

$\therefore$ Address holding capability of each block $= \frac{n}{4}$

$\therefore \left[10 + \frac{n}{4} + 2\left(\frac{n}{4}\right)^2 + \left(\frac{n}{4}\right)^3\right] n = 21056$

$\rightarrow 10n + \frac{n^2}{4} + \frac{n^3}{8} + \frac{n^4}{64} = 21056$

$\rightarrow n^4 + 8n^3 + 16n^2 + 640n = 21056 \times 64$

Solving for n, we get, $\boxed{n = 32}$