Exercise sheet 1 - Units and conversions

1. Convert the bandwidths given below to bps:
   a. 55 Mbps

   $= 55 \times 10^6$ bps

   b. 4.5 Gbps

   $= 4.5 \times 10^9$ bps

   c. 32 MBps

   $= 32 \times 10^6 \times 8 = 256 \times 10^6$ bps

   d. 85 KBps

   $= 85 \times 10^3 \times 8 = 680$ bps

   e. 24 Kbps

   $= 24 \times 10^3$ bps

2. Convert the times below into seconds:
   a. 2.53 ms

   $= 2.53 \times 10^{-3}$ secs

   b. 100 μs

   $= 100 \times 10^{-6}$ secs

   c. 0.33 ms

   $= 0.33 \times 10^{-3}$ secs

   d. 55 ns

   $= 55 \times 10^{-9}$ secs

   e. 85.3 ms

   $= 85.3 \times 10^{-3} = 0.0853$ secs

3. Convert the following:
   a. 1455 Mb into Gb

   $= \frac{1455 \times 10^6}{10^9} = 1.455$ Gb

   b. 85 GB into Mb

   $= \frac{85 \times 10^9 \times 8}{10^6} = 680{,}000$ Mb

   $= 6.8 \times 10^5$ Mb

c. 1077 Kb into Gb

$= \frac{1077 \times 10^3}{10^9} = 1077 \times 10^{-6} = 1.077 \times 10^{-3}$ Gb

d. 25000000 Mb into GB

$= \frac{25000000 \times 10^3}{10^9 \times 8} = 3.125 \text{ GB} \times 10^3 = 3125 \text{ GB}$

e. 105 Mbps into GBps

$= \frac{105 \times 10^6}{10^9 \times 8} = 13.125 \times 10^{-3} = 0.013125$ GBps

f. 1100 KBps into Mbps

$= \frac{1100 \times 10^3 \times 8}{10^6} = 8.8$ Mbps

g. 3340 Gbps into MBps

$= \frac{3340 \times 10^9}{10^6 \times 8} = 417.5 \times 10^3$ MBps

h. 5400 Kb into MB

$= \frac{5400 \times 10^3}{10^6 \times 8} = 0.675$ MB

i. 0.305 GBps into Kbps

$= \frac{0.305 \times 10^9 \times 8}{10^3} = 2.44 \times 10^6$ Kbps

j. 8000 KB into Gb

$= \frac{8000 \times 10^3 \times 8}{10^9} = 64 \times 10^{-3} = 0.064$ Gb

k. 0.0000054 Gb into B

$= \frac{0.0000054 \times 10^9}{8} = \frac{5400}{8} = 675$ B

l. 1055 Bps into Kbps

$= \frac{1055 \times 8}{10^3} = 8.44$ Kbps

m. 0.0000012 Mbps into KBps

$= \frac{0.0000012 \times 10^6}{10^3 \times 8} = \frac{0.0012}{8} = 0.00015$

$= 1.5 \times 10^4$ KBps