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Assignment 3

4.1

Elapsed time = (5000 km)/(1000 km/hr) = 5 hours = 18,000 seconds
Amount of data per diskette = 1.4 × 1024^2 × 8 = 11.74 × 10^6 bits/diskette
Number of diskettes = (10^7 g)/(30 g/diskette) = 333333 diskettes

Data transfer rate =11.74 ×10^6 (bits diskette) × (333333 diskettes)/18, 000 seconds = 217 Mbps

4.2

10 log (Po/Pi) = –20dB; Therefore, Po/Pi= 0.01

Pi = 0.5 Watt, Po = 0.005 Watt

SNR = 0.005/(4.5 × 10^-6) = 1.11× 10^3

SNRdB = 10 log (1.11 × 103) = 30 dB

4.8

λ = 2 × 2.5 × 10^–3 m = 5 × 10^–3 m

f = c/λ = (3 × 10^8 m/sec)/(5 × 10^-3 m) = 6 × 10^10 Hz = 60 GHz

4.13

LdB = 20 log(fMHz) + 120 +20 log (dkm) + 60 – 147.56

= 20 log(fMHz) +20 log (dkm) + 32.44