Tutorial 4

Ans 1. Transmission delay for 1-bit t = 1/ (10^7) = 0.1 micro seconds.
200 meters can be traveled in 1 micro second. Therefore, in 0.1 microseconds, 20 meters can be traveled.

Ans 2. The loss in the cable in decibels is 5 x (-0.3) = -1.5 dB. We can calculate the power as

$$\text{dB} = 10 \log_{10} \frac{P_2}{P_1} = -1.5$$
$$\frac{P_2}{P_1} = 10^{-0.15} = 0.71$$
$$P_2 = 0.71 P_1 = 0.7 \times 2 = 1.4 \text{ mW}$$

Ans 3 Bit rate = 2x4000x8 = 64000 bps= 64 kbps

Ans 4 As per Nyquist formula:

265,000 =2 X 20,000 X $\log_2$ L
log2 L =6.625

L =$2^{6.625}$ = 98.7 levels

Ans 5 Bit rate =2 x 3000 x $\log_2$ 2 =6000 bps

Ans 6 Time = 100,000/(5*1000) = 20 sec

Ans 7 No. of bits = Bandwidth* delay

No. of bits = 1 mbps*2 ms= 2000 bits