Prof. Sunil Bhooshan

Analogue Communication (10B11EC413)
(4th Semester ECE)

Test 1 (T1) 1 Hour. 15 Marks

Feb 2016.

1. Is the energy of $\delta(t)$ is finite or infinite?. Explain. (1 marks)
2. Find the energy of the signal
$$Ae^{-a|t|}$$
where a, A are both greater than zero and $-\infty < t < \infty$. (2 marks)
3. Show that the integral of (1 mark)
$$\int_{-5}^{5} \left(\frac{\sin t \cos t}{t^2+5} \right) \delta(t) dt = 0$$
4. Find the convolution of the function $p_s(t)$ shown in Figure 1 with itself. (5 marks)

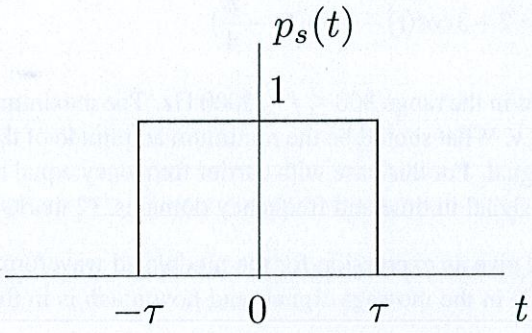
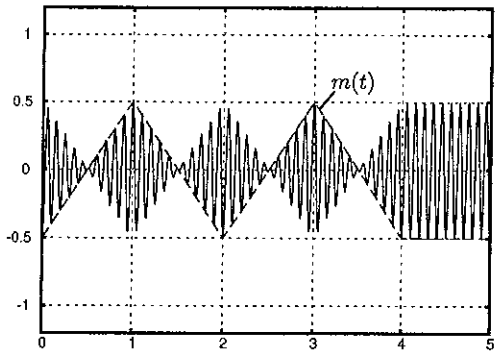
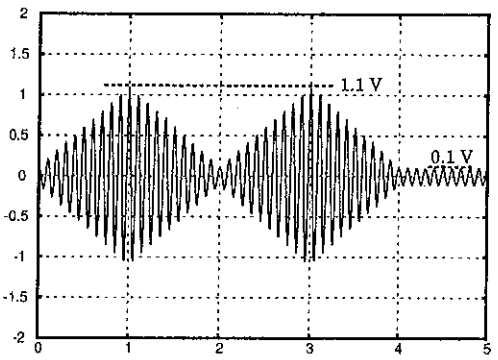


Figure 1: Pulse for Problem 4

(13)



(a)



(b)

Figure 2: Modulated waveforms

5. Find the trigonometric Fourier series of (1 mark)

$$f_T(t) = 2 + 3\cos(t) - 4\sin(5t - \frac{\pi}{4})$$

6. The spectrum of a signal lies in the range $300 \leq f \leq 5000$ Hz. The maximum amplitude of the signal is 1 V. What should be the minimum amplitude of the carrier to have AM/DSB signal. For this case with carrier frequency equal to 25 KHz plot the AM/DSB signal in time and frequency domains. (2 marks)

7. For the case of Figure 2(b), give an expression for the modulated waveform. How much average power is in the message signal, and how much is in the carrier? (3 marks)