COURSE CODE: 10B11EC413   MAX. MARKS: 50
COURSE NAME: Analogue Communications
COURSE CREDITS: 4   MAX. TIME: Two Hr

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Q1) What is impulse function? Write down at least four property of impulse function. [5]

Q2) Differentiate between dB and dBm. Find the value of (+20dBm)+(+21dBm) in dBm. [5]

Q3) Explain the various channels used in communication system with suitable diagram. [5]

Q4) Explain the difference among Analog, pulse and Digital modulation technique. [5]

Q5) Why we use Fourier Transform in communication system? Explain at least three property of Fourier Transform. [5]

Q6) Derive the relationship between the total transmitted power and carrier power in an AM system, when three frequencies simultaneously modulate a carrier. A carrier signal having 10V peak to peak amplitude is amplitude modulated by three different modulating frequencies with peak amplitude levels of 2V, 3V, and 4V respectively. Compute the modulation index of the resultant complex AM signal. [5]

Q7) A carrier signal with RMS voltage amplitude of 2V and a frequency of 1.5 MHz is amplitude modulated by a modulating sine wave with a frequency of 500 Hz and RMS amplitude level of 1 V. [10]

     a)   Write an expression for the resulting AM signal.
     b)   Sketch the audio signal
     c)   Sketch the carrier signal
     d)   Find out the power in side band
     e)   What frequency would present in a spectrum analysis of the modulated wave.

Q8) How DSB-SC signal is generates with the help of switching modulator? A DSB-SC signal is to be generated with a carrier frequency $f_c = 1MHz$ using a non-linear device with the input-output characteristic $V_o = a_o v_i + a_1 v_i^3$ Where a_o and a_1 are constants. The output of the non-linear device can be filtered by an appropriate band-pass filter. Let $V_i = A_c^i Cos(2\pi f_c^i t) + m(t)$ where m(t) is the message signal. Then find the value of f_c^i (in MHz)? [10]