CLASS: BE   SEMESTER: VI
BRANCH: IT   SESSION : SP/2019

SUBJECT : IT6021 COMMUNICATION THEORY

TIME: 1.5 HOURS   FULL MARKS: 25

INSTRUCTIONS:
1. The total marks of the questions are 30.
2. Candidates may attempt for all 30 marks.
3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. The missing data, if any, may be assumed suitably.

Q1 (a) Draw the block diagram of communication system and briefly explain the function of each block.   [2]
    (b) State and prove the modulation theorem property of Fourier transform and find the Fourier transform of the delta function and sketch its spectrum.   [3]

Q2 (a) Obtain Fourier transform of a rectangular pulse g (t) of duration T and amplitude A and draw its spectrum.   g (t) = rect (t/T) = A   for –T/2 ≤ t ≤ T/2
                                                  0 elsewhere   [2]
    (b) Define energy spectral density and state and prove Rayleigh energy theorem.   [3]

Q3 (a) Derive the expression for total transmitted power in terms of carrier power and modulation index for single tone AM.   [2]
    (b) Discuss the coherent detector used for DSB-SC demodulation also discuss the various cases of frequency and phase errors.   [3]

Q4 (a) Explain the operation of envelope detector with neat diagram and mention the conditions of charging and discharging time constants.   [2]
    (b) Explain the phase discriminator method of SSB generation. List its advantages and disadvantages with respect to other methods.   [3]

Q5 (a) Explain the difference between narrowband FM and wideband FM.   [2]
    (b) A 25 MHz carrier is modulated by a 400 Hz audio signal. If the carrier voltage is 4 volts peak and the maximum frequency deviation equals to 75 KHz, Obtain the equation of FM wave. Is it NBFM or WBFM?   [3]

Q6 (a) Explain the term frequency deviation and phase deviation for an angle modulation system.   [2]
    (b) Compare Amplitude modulation and Frequency modulation. Why FM is more immune to the effect of noise.   [3]

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