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Total Number of Pages : 02

B.Tech
PET5I103

5th Semester Regular / Back Examination 2019-20

ANALOG COMMUNICATION

BRANCH : ECE, ETC

Max Marks : 100

Time : 3 Hours

Q.CODE : HRB232

Answer Question No.1 (Part-1) which is compulsory, any EIGHT from Part-II and any TWO from Part-III.

The figures in the right hand margin indicate marks.

Part- I

Q1 Only Short Answer Type Questions (Answer All-10) (2 x 10)

- Write Time scaling property with an example.
- Define power spectral density.
- Write the Dirichlet's condition for Fourier series.
- Draw the single sided frequency spectrum for a single tone amplitude modulated signal.
- Write the applications of Hilbert transform.
- Define frequency deviation for FM wave.
- Define conditional probability density function.
- What is the importance of Gaussian distribution?
- Write the drawbacks of Tuned Radio Frequency Receiver.
- Find the Fourier transform of $\delta(\omega - \omega_0)$.

Part- II

Q2 Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve) (6 x 8)

- Summarize the cause and effects of thermal noise in electronic systems, in terms of noise power, voltage, and spectral density.
- Define noise equivalent band width and derive the expression for the same.
- Describe the working of a BJT-based amplitude modulator circuit.
- Explain diagonal peak clipping in diode detector circuits.
- An AM broadcast receiver has an IF of 465 KHZ and is tuned to 1000 KHZ, and the RF stage has a tuned circuit with a Q of 50. Find (a) image frequency (b) image rejection in decibels.
- Write short notes on Automatic frequency control and amplitude limiters.
- With the help of block diagram, explain the working of costas loop.
- Explain the concept of pre-envelope. Obtain the Hilbert transform of the function $x(t) = \sin 2\pi f t$.
- Let X be a continuous random variable having a uniform probability distribution defined in the range $2 \leq x \leq 4$. Let $y=3X+2$. Find the means m_x and m_y .
- For an AM signal $s(t) = A_c \cos[2\pi f_c t + \phi(t)]m(t)$, find
 - Pre-envelope
 - Complex envelope
 - Natural envelope
- Derive the time domain expression of VSB modulated wave containing a vestige of upper side band.
- With relevant block diagram explain FM stereo multiplexing.

