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Total Number of Pages: 02

B.TECH
PCEC4302

5th Semester Regular / Back Examination 2015-16
ANALOG COMMUNICATION TECHNIQUES

BRANCH: EC,ETC

Time: 3 Hours

Max marks: 70

Q.CODE: T253

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

- Q1** Answer the following questions: **(2 x 10)**
- a) Give the block diagram representation of an electronic communication system.
 - b) Differentiate the mathematical representation of a periodic signal between trigonometric Fourier series and complex exponential Fourier series.
 - c) State and prove the time scaling property of Fourier Transform.
 - d) Find out the frequency spectrum of AM wave.
 - e) Draw the power spectral density of white noise.
 - f) Differentiate between pre-emphasis and de-emphasis.
 - g) What is the need for frequency translation?
 - h) What is noise? Differentiate between shot noise and thermal noise.
 - i) What is the transmission bandwidth for AM and FM signal.
 - j) Assuming no over modulation calculate the modulation index when the maximum and minimum values of envelope of AM system are 3v and 1v respectively.
- Q2** a) Find out the Fourier Transform of $g(t) = \exp(-t) u(t)$ **(5)**
b) Describe one method with neat sketch for generation of DSBSC waves. **(5)**
- Q3** a) Describe the operation of Frequency Modulation. **(5)**
b) A carrier is frequency modulated by 4KHz sine wave resulting in an FM signal having a maximum frequency of 107.218MHz and a minimum frequency of 107.196MHz. Find the carrier frequency, frequency deviation and the modulation index of FM signal. **(5)**
- Q4** Derive the SNR for an AM receiver using coherent detection with DSBSC modulation and also calculate the figure of merit. **(10)**
- Q5** a) Illustrate the pulse amplitude modulation with neat sketch. **(5)**
b) Describe the operation of PWM and PPM techniques. **(5)**
- Q6** a) Describe the RC low pass linear filtering of noise. **(5)**
b) Explain FM threshold effect. **(5)**

Q7 a) Derive the expression for power of a modulated AM wave in terms of carrier power. **(5)**

b) An AM signal contains 1KW in its carrier frequency and 200Watts in each side band. What is the percentage of modulation and find the allocation of power if percentage of modulation is changed to 80%. **(5)**

Q8 Write short notes on any two: **(5 x 2)**

a) Time Division Multiplexing

b) Signal to Noise Ratio

c) Angle Modulation

d) NBFM