Reg. No. :

Question Paper Code: 51435

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Third Semester

Electronics and Communication Engineering

15UEC305 - ANALOG COMMUNICATION

(Regulation 2015)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. The bandwidth for amplitude modulated wave is

    (a) $2f_m$ (b) $f_m/2$ (c) f_m (d) $4f_m$

2. The bandwidth requirement for angle modulated wave is

    (a) $2f_m$ (b) $2[\delta+f_{m(max)}]$ (c) δf_m (d) δ/f_m

3. The expression for cumulative distributive function is

    (a) $Fx(X=P(X\leq x))$ (b) $P(X\geq x)$ (c) $X=x$ (d) $P(x)$

4. The expression for output signal power in FM receiver is

    (a) $K_f P$ (b) K_f/P (c) $K_f^2 P$ (d) P/k_f

5. The expression for sampling theorem is

    (a) $f_s=2f_m$ (b) $f_s<2f_m$ (c) $f_s\geq sf_m$ (d) $f_s=f_m$

PART - B (5 x 3 = 15 Marks)

6. List the disadvantages of SIngle Side Band (SSB) modulation techniques.

7. Define frequency modulation and draw waveforms.

8. Define random variables with examples.

9. What is meant by channel signal to noise ration (SNR)? And write the expression.

10. List the two different types of errors in quantization process and differentiate between these two errors.

PART - C (5 x 16 = 80 Marks)

11. (a) (i) An audio frequency signal $10\sin2\pi$ x 500t is used to amplitude modulate carrier of $50\sin2\pi$ x 10^5t. Calculate modulation index, side band frequencies, amplitude of each side band frequencies, bandwidth required and total power delivered to the load of 600Ω. (10)

    (ii) Write short notes on vestigial sideband transmission. (6)

Or

   (b) (i) Draw a block diagram and discuss in detail about phase shift method to generate Single Side Band (SSB). (8)

    (ii) Discuss briefly about Double Side Band suppressed carrier system. (8)

12. (a) Draw a phasor diagram and explain in detail about indirect method for frequency modulation transmitter. (16)

Or

   (b) (i) Explain briefly about the working principle of balanced slope detector. (8)

    (ii) Explain briefly about the working principle of Foster-Seeley discriminator. (8)

13. (a) (i) Differentiate the performance of Strict Sense Stationary (SSS) process and Wide Sense Stationary (WSS) process. (8)

    (ii) Explain the properties of Probability Density Function (PDF). (8)

Or

   (b) (i) A Probability Density Function (PDF) of a random variable 'X' is given by $f_x(x)=e^{-x}$ for x≥0. Find mean E[X], mean square E[X^2], E[$(X-1)^2$], variance and standard deviation. (10)

    (ii) What are external noises? Explain briefly. (6)

2

51435

14. (a) Explain with supporting equations principle of noise in SSB-SC receiver. (16)

Or

(b) Discuss in detail about the function of Pre-emphasis and De-emphasis. (16)

15. (a) Explain in detail about the concept of Pulse Amplitude Modulation (PAM) and also mention its advantage and its application. (8)

Or

(b) Draw a block diagram of Pulse Position Modulation (PPM) and explain in detail about the working principle. (16)

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51435

51435