C

Reg. No. :

Question Paper Code: 53405

B.E./B.Tech. DEGREE EXAMINATION, MAY 2022

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 minimum channel bandwidth is used by which modulation technique?   CO1- R

    (a) VSB   (b) SSB - SC   (c) DSB - SC   (d) AM

2. What is the disadvantage of FM over AM?   CO2- R

    (a) High modulating Power is needed   (b) Required high output power

    (c) Large bandwidth required   (d) High noise is produced

3. What is the probability density function of thermal noise?   CO3- R

    (a) Gaussian   (b) Poisson   (c) Binomial   (d) Bessel

4. De-emphasis circuit is used _____.   CO4- R

    (a) Before decoding   (b) After decoding   (c) Before detection   (d) After detection

5. Which among the following is the drawback of pulse position modulation?   CO5- R

    (a) The transmission power is not constant

    (b) Synchronization is required between receiver and transmitter

    (c) Amplitude is constant

    (d) Instantaneous power of PPM modulated signal is constant

PART – B (5 x 3= 15 Marks)

6. What is VSB? Where is it used?   CO1- R

7. A carrier is modulated with a sinusoidal signal of 2KHz, resulting in a maximum frequency deviation of 5KHz. Find modulation index and bandwidth of the modulated signal.   CO2-R

8. Define noise figure and noise equivalent temperature.   CO3- R

9. Comment the role of pre-emphasis and de-emphasis circuit in SNR improvement.   CO4- R

10. List the advantages of PPM.   CO5- R

PART – C (5 x 16= 80 Marks)

11. (a) (i) Explain with suitable diagrams the generation of AM using square law method.   CO1- U   (10)

(ii) Explain the demodulation of AM using envelope detection.   CO1- U   (6)

Or

(b) Derive the expression for DSB-SC AM and calculate its power and efficiency. Explain a method to generate and detect it.   CO1- U   (16)

12. (a) (i) Derive an expression for a single tone FM signal with necessary diagrams and draw its frequency spectrum.   CO2- U   (10)

(ii) Explain the working operation of balanced slope detector.   CO2- U   (6)

Or

(b) (i) Explain with diagrams the generation of FM using direct method.   CO2- U   (8)

(ii) With the phasor representation, explain Foster Seeley discriminator.   CO2- U   (8)

13. (a) (i) Explain the following terms: mean, correlation and covariance.   CO3- U   (8)

(ii) What is a Gaussian random process and mention its properties.   CO3- U   (8)

Or

(b) (i) Define noise. Explain the various types of internal noise.   CO3- U   (8)

(ii) Explain with derivation the effect of noise in cascaded amplifier circuit.   CO3- U   (8)

14. (a) With a neat block diagram, explain the function of super heterodyne   CO4- U   (16)
receiver.

<center>Or</center>

(b) Explain the noise in FM receiver and calculate the figure of merit for   CO4- U   (16)
a FM system.

15. (a) (i) With neat sketches, explain about uniform quantization.   CO5- U   (8)

(ii) What is non-uniform quantization? Discuss in detail.   CO5- U   (8)

<center>Or</center>

(b) Explain the generation and detection of PWM with neat diagram.   CO5- U   (16)

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