Code: 20A04402T

R20

B.Tech II Year II Semester (R20) Regular & Supplementary Examinations April/May 2024
COMMUNICATION SYSTEMS
(Electronics & Communication Engineering)

Time: 3 hours

Max. Marks: 70

PART – A
(Compulsory Question)
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1   Answer the following: (10 X 02 = 20 Marks)
  (a) List out the advantages and disadvantages of SSB.   2M
  (b) A Radio transmitter radiates 20 KW and carrier power is 10 KW. Calculate modulation index. 2M
  (c) What is meant by Noise? List the different types of Noise.   2M
  (d) Mention the drawbacks of the delta modulation.   2M
  (e) What is the Matched filter?   2M
  (f) What is the significance of Eye pattern?   2M
  (g) What is a correlator?   2M
  (h) Define digital passband transmission.   2M
  (i) What are the drawbacks of DPSK?   2M
  (j) Give the Signal Space representation of QPSK.   2M

PART – B
(Answer all the questions: 05 X 10 = 50 Marks)

2 (a) How AM is generated using square law modulator. Derive relevant expressions.   5M
   (b) Why VSB modulation is used in TV broad casting? Give the VSB filter characteristics with 5M
        spectrum.

OR

3 (a) Draw the block diagram of a super heterodyne receiver and explain the function of each block. 6M
   (b) A super heterodyne receiver having RF amplifier is tuned to 555 kHz. The local oscillator is 4M
        adjusted to 1010 kHz. Then calculate the IF and image frequency.

4 (a) With a neat sketch explain the principle and operation of PCM.   5M
   (b) Discuss the basic concepts of Time division Multiplexing.   5M
OR
5 (a) Discuss the noise performance of AM system using envelope detection.   6M
   (b) Compare PCM and Delta Modulation systems.   4M

6 (a) Explain the concept of equalization in baseband pulse transmission systems.   5M
   (b) List and explain the properties of Matched filter.   5M
OR
7 (a) Describe the concept of correlative level coding and its role in reducing ISI in baseband pulse 5M
        transmission systems.
   (b) Discuss quadrature amplitude modulation (QAM) advantages and applications in baseband   5M
        pulse transmission systems.

8 (a) Explain the response of a bank of correlators in the presence of noise.   5M
   (b) Explain the Gram-Schmidt orthogonalization procedure and its application in passband   5M
        transmission systems.

OR

9 (a) Describe the passband transmission model, including the modulation scheme used and the characteristics of the passband channel.   5M

   (b) Write a brief note on detection of signals with unknown phase.   5M

10 (a) Show the space representations of: 5M
        (i) ASK
        (ii) QPSK
        (iii) BPSK
        Also show their waveform.

    (b) Give the comparison of M-ary digital modulation techniques.   5M

OR

11 (a) A source emits one of 4 symbols s_0, s_1, s_2, s_3 with probabilities 1/3, 1/6, 1/4, 1/4 respectively. The successive symbols emitted by the source are statistically independent. Calculate the entropy of the source.   5M

    (b) Compare QPSK with all other digital signalling schemes.   5M

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R20

B.Tech II Year II Semester (R20) Regular & Supplementary Examinations August/September 2023
COMMUNICATION SYSTEMS
(Electronics & Communication Engineering)

Time: 3 hours

Max. Marks: 70

PART – A
(Compulsory Question)
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1   Answer the following: (10 X 02 = 20 Marks)
 (a) What is modulation index and percentage modulation in AM?   2M
 (b) State Carson's rule.   2M
 (c) What are the advantages and disadvantages of digital transmission?   2M
 (d) What is the principle of pulse modulation? And list four methods of PM.   2M
 (e) What are the advantages of M-ary signaling scheme?   2M
 (f) What is an eye pattern?   2M
 (g) Compare analog and digital modulation.   2M
 (h) Define Nyquist sampling theorem.   2M
 (i) Find entropy of a source emitting symbols x, y, z with probabilities of 1/5, 1/2, 1/3 respectively.   2M
 (j) What is the capacity of the channel having infinite bandwidth?   2M

PART – B
(Answer all the questions: 05 X 10 = 50 Marks)

2   In an AM modulator, 500 KHz carrier of amplitude 20 V is modulated by 10 KHz modulating   10M
     signal which causes a change in the output wave of +_ 7.5 V.
     Determine:
     (i) Upper and lower side band frequencies.
     (ii) Modulation Index.
     (iii) Peak amplitude of upper and lower side frequency.
     (iv) Maximum and minimum amplitudes of envelope.
OR
3   Write a detailed note on frequency spectrum analysis of angle modulated waves.   10M

4   Discuss about the sets of side bands produced when a carrier is frequency modulated by a   10M
     single frequency sinusoid.
OR
5   Explain in detail the Delta modulation transmitter and Receiver.   10M

6 (a) Discuss about the causes of ISI with a neat schematic.   5M
   (b) Distinguish between MAP and QAM.   5M
OR
7   Explain in detail, the principle of correlation receiver.   10M

Contd. In page 2

8   Use the Gram-Schmidt procedure to find a set ortho normal basis functions corresponding to the   10M
       signals show below also Express x_1, x_2, and x_3 in terms of the ortho normal basis functions.
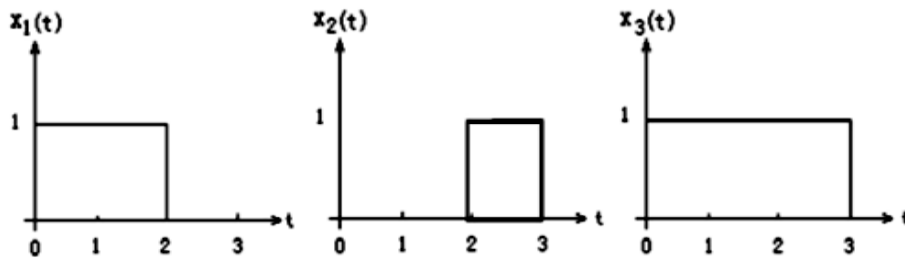
OR

9   Explain in detail, the principle of correlation receiver.   10M

10   With the help of diagrams, explain the working of non coherent DPSK transmitter &receiver.   10M
OR
11   What is known as Binary phase shift keying? Discuss in detail the BPSK transmitter and   10M
       Receiver and also obtain the minimum double sided Nyquist bandwidth.

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