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Question Paper Code: 94405

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

Fourth Semester

Electronics and Communication Engineering

19UEC405– Analog And Digital Communication

(Regulations 2019)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

- _____ is the process in which frequency of the carrier signal changes with respect to message or modulating signal CO1-U
(a) Pulse modulation (b) Angle modulation
(c) Amplitude modulation (d) Frequency modulation
- The SNR in delta modulation is _____ CO2-App
(a) Fair (b) Poor (a) Good (b) None of the above
- The main objective of Trellis coding is CO1-U
(a) To narrow the Bandwidth (b) To simplify the modulation
(c) To increase the data rate (d) To reduce the error rate
- The maximum bandwidth is occupied by CO1- U
(a) ASK (b) BPSK (c) FSK (d) none of these
- Frequency hopping involves a periodic change of transmission CO1- U

(a) Signal (b) frequency (c) Phase (d) Amplitude

PART – B (5 x 3= 15 Marks)

- What is the effect of m_f on the bandwidth of FM? CO2- App
- State sampling theorem CO1- U
- What is information rate CO1- R
- Write the expression for bit error rate for coherent PSK CO1-U

10. A Pseudo noise sequence is generated using feedback shift register of length $m=4$. The chip rate is 107 chips per sec. Find length and chip duration of PN sequence. CO2-App

PART – C (5 x 16= 80 Marks)

11. (a) Explain the generation of FM signals with neat diagram CO1- U (16)
 Or
 (b) Derive the expression of an AM wave, modulation index, total power and Transmission efficiency CO1- U (16)
12. (a) A signal has a bandwidth of 10MHz and dynamic amplitude of -5V to 5V. The signal is sampled, quantized and binary coded to obtain PCM signal. Find the following (i) sampling or nyquist rate when the samples are encoded into 128. (ii) what is binary bits required to each sample (iii) bit rate (iv) transmission bandwidth (v) step size CO2- App (16)
 Or
 (b) Consider the input data sequence 1011011. Sketch the waveforms for each of these sequences using following methods . (i) Unipolar NRZ (ii) Unipolar RZ (iii) Polar NRZ, (iv) Polar RZ (v) Bipolar NRZ (vi) Bipolar RZ (vii) Manchester (viii) Differential Manchester (Line Coding) CO2- App (16)
13. (a) A discrete memoryless source has 6 symbols $s_1, s_2, s_3, s_4, s_5, s_6$ with probabilities 0.4, 0.1, 0.2, 0.1, 0.1 and 0.1 respectively. Construct a Huffman code and calculate its efficiency CO3- App (16)
 Or
 (b) Consider the generator polynomial for a (7,3) cyclic code defined by $g(p) = P^4 + P^3 + P^2 + 1$ CO3- App (16)
 (a) Find the encoding table for the cyclic code.
 (b) What is the minimum distance d_{min} of the code.
14. (a) Discuss in detail the DPSK transmitter and Receiver and also obtain the minimum double sided Nyquist bandwidth. CO1- U (16)
 Or
 (b) Explain the digital modulation techniques in which the phase of the modulated signal is shifted relative to the previous signal element CO1- U (16)

15. (a) Explain the two common spread spectrum techniques for wireless communication. CO1- U (16)
- Or
- (b) Differentiate direct sequence and frequency hopping spread spectrum techniques CO1- U (16)

