Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Third Semester B.Tech (Minor) Degree Examination December 2021 (2020 admission)

Course Code: ECT283

Course Name: ANALOG COMMUNICATION

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions. Each question carries 3 marks Marks

1 A receiver connected to an antenna whose noise factor is given by 2. Compute the receiver noise figure in decibels & its equivalent noise temperature? (T_0 =300K). (3)

2 Which type of signals are called Even and Odd signals? Compare. (3)

3 State Parseval's theorem for FT. What is its significance? (3)

4 What is the significance of modulation property of Fourier Transform? (3)

5 What do you meant by image frequency? How does it work? (3)

6 What do you meant by a pre-emphasis network? (3)

7 Give any three applications of FM? (3)

8 Distinguish between Causal and Non-Causal systems with suitable examples? (3)

9 What do you meant by Partition Noise? (3)

10 Check whether the system is time invariant or not? (3)

$y(t)=tx(t)$

PART B

Answer any one full question from each module. Each question carries 14 marks

Module 1

11 (a) Explain the elements of communication systems in detail? (9)

(b) What do you meant by White Noise? What are the factors that depend upon noise power in a communication system? (5)

12 (a) Discuss various sources of noise and its effects in communication systems. (10)

(b) What are the various frequency bands used in radio communication system? (4)

Module 2

13 (a) Determine whether the given system is an LTI system (10)

(i) $y(t) = x^2(t)$ (ii) $y(t) = t^2x(t)$

(b) State and prove the Sifting property of Impulse function. (4)

14 (a)Determine the output response y(n) if x(n)={1,2,3,2} and h(n)={1,2,2}using graphical method of convolution. (10)

(b) Find convolution of signal x[n] = [1,-1, 1, 1] with itself? (4)

Module 3

15 (a)A broadcast radio transmitter radiates 10kW power with carrier unmodulated and 12kW when the carrier is sinusoidally modulated. Calculate the percentage of modulation. If another sine wave corresponding to 50% modulation is transmitted simultaneously, determine the total radiated power? (10)

(b) What are the salient features of AM? Also give any two applications of AM. (4)

16 Explain the working of Envelope Detector. Also explain the two type of distortions that encountered in it. (14)

Module 4

17 (a) Explain with relevant mathematical expressions, the demodulation of FM signal using PLL? (10)

(b) Compare Wide band FM and Narrow band FM. (4)

18 (a) Explain FM slope detection. (9)

(b) Explain Frequency Modulation and its average power. (5)

Module 5

19 (a) For a receiver with IF and RF frequencies of 455kHz and 900kHz respectively, determine the following: (6)

(i) The local oscillator frequency

(ii) Image frequency

(b) Explain carrier synchronization using PLL. (8)

20 (a) What are the advantages of RF amplifier? (5)

(b) Explain NTSC Television broadcasting system using AM. (9)

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