PAPER ID-421486

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM IV) THEORY EXAMINATION 2021-22
COMMUNICATION ENGINEERING

Time: 3 Hours ***Total Marks: 100***

Note: Attempt all Sections. If you require any missing data, then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2*10 = 20**

Qno	Questions	CO
(a)	Define the bandwidth of a system and compare the bandwidth of DSB-C, DSB-SC and SSB-SC.	1
(b)	Illustrate transmission efficiency of DSB-C, DSB-SC, and SSB-SC.	1
(c)	Define Phase modulation and draw its output waveform.	2
(d)	Illustrate the concept of Carson's rule for BW calculation.	2
(e)	Define Noise Factor for a system.	3
(f)	Interpret the noise performance of an amplitude modulated wave in terms of noise figure.	3
(g)	Elaborate the term TDM with example.	4
(h)	Find Nyquist rate & Interval for signal: $x(t) = 4\sin(30\pi t) + 3\cos(70\pi t)$.	4
(i)	Discuss the reason why non-coherent demodulation is not possible for BPSK.	5
(j)	Explain and draw the signal space diagram for FSK.	5

SECTION B

2. Attempt any *three* of the following: **10*3 = 30**

Qno	Questions	CO
(a)	Illustrate the idea of having modulation index for an AM signal equal to 1, greater than 1, and less than 1.	1
(b)	Demonstrate Frequency Modulation technique with its expression and output.	2
(c)	Explain the properties of Probability Density function and Cumulative Distribution Function.	3
(d)	Explain the following in reference to the delta modulation (DM). a. Granular Noise and b. Slope overload Provide the quantization noise for the DM with a step size Δ (Delta).	4
(e)	Illustrate the Modulator and Demodulator for Amplitude Shift Keying.	5

SECTION C

3. Attempt any *one* part of the following: **10*1 = 10**

Qno	Questions	CO
(a)	Draw and explain the modulator and demodulator of DSB-SC.	1
(b)	Find out the Continuous time Fourier transform of rectangular pulse. Also draw the magnitude spectrum of the output.	1

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4. Attempt any *one* part of the following: 10 *1 = 10

Qno	Questions	CO
(a)	Demonstrate Phase Modulation with mathematical expression and its output.	2
(b)	Derive and explain Narrow Band Frequency Modulation with FM generator.	2

5. Attempt any *one* part of the following: 10*1 = 10

Qno	Questions	CO
(a)	Illustrate the Noise factor for coherent demodulation of a DSB-SC signaling.	3
(b)	Illustrate the relation between the transfer function of Pre-emphasis and De-emphasis for frequency modulation.	3

6. Attempt any *one* part of the following: 10*1 = 10

Qno	Questions	CO
(a)	Evaluate the sampling theorem for a low pass analog message signal with an explanation of the mathematical expression for the sampling process.	4
(b)	Draw and explain the block diagram of transmitter, channel and receiver of PCM system.	4

7. Attempt any *one* part of the following: 10*1 = 10

Qno	Questions	CO
(a)	Illustrate the concept of QPSK with its modulator and demodulator. Also draw the signal space diagram for the QPSK.	5
(b)	Illustrate the concept of MSK with its modulator and demodulator. Also draw the signal space diagram for the MSK.	5