Sub Code: REE052

Paper Id: 120505 Roll No:

BTECH
(SEM V) THEORY EXAMINATION 2019-20
PRINCIPLES OF COMMUNICATION

Time: 3 Hours *Total Marks: 70*

Note: 1. Attempt all Sections. If required any missing data, then choose suitably.

SECTION A

1. Attempt all questions in brief. **2 x 7 = 14**

a.	Define modulation. Why it is needed?
b.	Compare baseband and passband signal.
c.	What do you mean by modulation index?
d.	List Comparison between Narrowband & Wideband FM.
e.	How to avoid aliasing effect in a sampled signal?
f.	Define White Noise. Also draw its Spectral Density Curve.
g.	List the disadvantages of SSB modulation scheme.

SECTION B

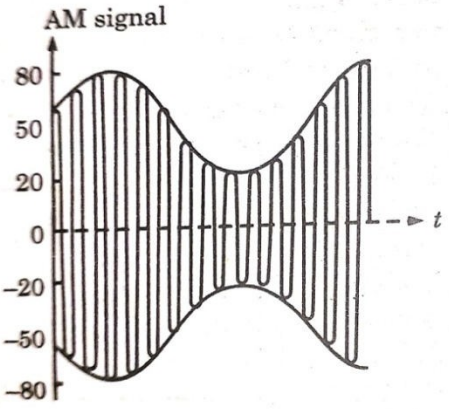
2. Attempt any *three* of the following: **7 x 3 = 21**

a.	Draw the block diagram of communication system and explain the function of each block.
b.	Describe indirect method (Armstrong method) of FM generation with mathematical analysis and suitable diagrams.
c.	What do you mean by nyquist rate? Find the nyquist rate and nyquist interval for the signal $x(t) = \frac{1}{2\pi}\cos(4000\pi t)\cos(1000\pi t)$
d.	Discuss the classification, working, advantages and one application of each type of vocoder.
e.	Explain TDM and FDM using Pulse Amplitude Modulation.

SECTION C

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

(a)	(i)	Determine the modulation index and percentage modulation of the signal shown in figure.



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	(ii)	The antenna current of an AM transmitter is 8 A if only the carrier is sent, but it increases to 8.93 A if the carrier is modulated by a single sinusoidal wave. Determine the percentage modulation. Also find the antenna current if the percentage of modulation changes to 0.8.
(b)		With the support of mathematical expressions and suitable diagram explain the working of balanced modulator.

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

(a)	Differentiate between FM and AM.
(b)	Derive the mathematical expression for single tone frequency modulation.

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

(a)	Explain T1 Digital System.
(b)	State and prove sampling theorem. Also determine the nyquist rate for the signal $x(t) = 3\cos 50\pi t + 10\sin 300\pi t - cos100\pi t$

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

(a)	What is noise? What are various forms of noise? Discuss the importance of S/N ratio in the radio receiver.
(b)	Describe adaptive delta modulation in detail with its block diagram.

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

(a)	(i)	Write short note on Pre-emphasis and De- emphasis.
	(ii)	Describe the functional blocks of phase locked loop with suitable diagram.
(b)		What do you mean by figure of merit? Evaluate figure of merit of an AM receiver operating on single tone AM.