(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 121601 Roll No. _____

B.Tech.
(SEM. VI) THEORY EXAMINATION 2013-14
ANALOG & DIGITAL COMMUNICATION

Time : 3 Hours   *Total Marks : 100*

Note :– Attempt **all** questions. All questions carry equal marks.

1.   Attempt any **four** parts of the following :   (5×4=20)

   (a)   What is modulation ? Why the modulation is needed ?

   (b)   Prove that the Balance modulator removes the carrier and gives the two sidebands only.

   (c)   Draw the block diagram of phase shift method for generating the SSB signal and explain its working.

   (d)   What is VSB modulation ? What is the application of VSB modulation ?

   (e)   The antenna current of an AM transmitter is 8 amp when only the carrier is sent, but it increases to 8.93 amp when the carrier is modulated by a single sine wave. Find the percentage of modulation. Determine the antenna current when the percentage of modulation changes to 0.8

   (f)   What is the advantage of quadrature amplitude modulator ? Explain with the help of suitable block diagram ?

2.   Attempt any **two** parts of the following :   (10×2=20)

   (a)   What is the advantages of frequency modulation ? The carrier frequency of an FM broadcast transmitter is 100 MHz and maximum frequency deviation is 75 kHz. If the highest audio frequency modulating the carrier is 15 kHz, what is the approximate bandwidth of the signal ?

   (b)   Explain the working of a balanced frequency discriminator with the help of a circuit diagram.

   (c)   What is noise ? What are various forms and sources of noise ?

3.   Attempt any **four** parts of the following :   (5×4=20)

   (a)   What is pulse code modulation ? Explain the suitable diagram.

   (b)   What is quantization ? How quantizing and coding is done. Explain with suitable waveform.

   (c)   What is delta modulation ? Discuss the errors in delta modulation. https://www.aktuonline.com

   (d)   Draw the block diagram of generation of PWM and explain the working operation.

   (e)   What is differential pulse code modulation ? Explain the working of differential pulse code modulation ?

   (f)   What is adaptive delta modulation ? Explain.

4. Attempt any **two** parts of the following : (10×2=20)

   (a) Draw the block diagram of Amplitude shift keying system and explain the working operation.

   (b) Explain with the help of diagram, a method of generating and demodulating phase shift keying signals.

   (c) What is Time Division multiplexing ? Explain with suitable diagram.

5. Attempt any **two** parts of the following : (10×2=20)

   (a) Write a note on T TDM PCM hierarchy form T_1 to T_4.

   (b) (i) Consider 8 alphabet source with probability of occurrence as follows :

Symbol	A	B	C	D	E	F	G	h
Probability	0.30	0.20	0.15	0.12	0.10	0.07	0.04	0.02

   According to Shannon-Fano techniques, generate the binary codes.

   (ii) Determine the Huffman Code for the following message with their probabilities give :

x	x_1	x_2	x_3	x_4	x_5	x_6	x_7
p	0.05	0.15	0.2	0.05	0.15	0.3	0.1

   (c) What is information ? How is information measured ? What is channel capacity ?