

SC. sem. IV - IT

30/5/12

Principles of comm' Engg.

GN-8453 1

Con. 4487-12.

GN-8453

(3 Hours)

[Total Marks : 100

- N.B.** (1) Question No. 1 is **compulsory**.
(2) Attempt any **four** questions from remaining **six** question.
(3) Assume suitable data if **necessary**.
(4) **Figures** to the **right** indicate **full marks**.
- (a) What is effect of Gaussian noise on digital communication ? **5**
(b) A 4 kHz bandlimited signal is sampled at Nyquist rate and quantized to 4 levels, **5**
Q. 1, Q. 2, Q. 3 and Q. 4. The respective probabilities are $P_1 = P_2 = 1/8$ and $P_3 = P_4 = 3/8$.
Find the rate of information.
(c) Prove time convolution property of Fourier transform. **5**
(d) Explain Electronic Communication System with block diagram. **5**
 - (a) Draw circuit diagram of Foster Seeley discriminator and explain its working with phasor diagrams. **10**
(b) Explain overload and hunting error in Delta Modulation. Find the condition to avoid slope overload error. **10**
 - (a) Draw the circuit diagram for ring modulator for generating DSB-SC AM signal and explain its working. **10**
(b) Explain working of envelope detector. An audio signal of bandwidth 5 kHz is modulated on carrier frequency 1 MHz using conventional AM. Determine range of values of RC for successful demodulation of this signal using an envelop detector. **10**
 - (a) What is multiplexing in communication systems ? Draw the block diagram of frequency division multiplexing to transmit five signals. **10**
(b) A carries $C(t) = A \cos 2\pi 10^6 t$ is angle modulated (PM or FM) by a sinusoid signal $m(t) = 2 \cos 2000 \pi t$. The deviation constants are $k_p = 1.5 \text{ rad/V}$ and $K_f = 3000 \text{ Hz/V}$.
(i) Determine modulation index in each case **10**
(ii) Determine the bandwidth in each case using Carson's rule
(iii) If amplitude of $m(t)$ is decreased by a factor of two how would bandwidth change.
 - (a) Explain the concept of image frequency and its rejection. Discuss double spotting. **10**
(b) Prove sampling theorem for low pass signals. What is use of anti aliasing filter. **8+2**
 - (a) Draw the ASK, PSK and FSK waveforms for digital data 10100110. **10**
(b) What is need of pre-emphasis and De-emphasis in FM ? Explain the standards used for the same with circuits. **10**
 - (a) Define Noise factor and Noise temperature. **5**
(b) Compare TDM and FDM. **5**
(c) Explain Friss Transmission formula. **5**
(d) Discuss Third Method of SSB generation. **5**