

11/12/13

SE (I.T) Sem IV
Principles of Communication Engg.

29-10-2013-DTP-P-8-KG-11

Con. 5758 -13.

LJ-10583

(3 Hours)

[Total Marks : 100

- N.B. :** (1) Question No. 1 is **compulsory**.
 (2) Attempt any **four** out of **remaining six** questions.
 (3) **Figures to right** indicate **full marks**.
 (4) Assume suitable data if necessary.

1. Answer the following (any **four**) :-
 - (a) List frequency band and communication application of usable frequency spectrum. **5**
 - (b) Prove time convolution property of Fourier transform. **5**
 - (c) Define Noise figure and Noise factor. **5**
 - (d) Explain A - law and U - law companding. **5**
 - (e) Explain why FM is more Immune to Noise. **5**

2. (a) Explain FM Noise triangle. What is pre-emphasis and De-emphasis ? Explain with ckt diagram. **10**
- (b) State advantages of SSB over DSBFC. Explain filter method to generate SSB AM. **10**

3. (a) The signal $m(t) = 3 \cos (200 \pi t) + \sin (600 \pi t)$ is used to modulate the carrier $c(t) = \cos (2 \times 10^5 t)$. The modulation Index is $\mu = 0.85$. Determine the power in carrier component and in the sideband components of modulated signal. **10**
- (b) State and prove sampling Theorem for Low pass signal. What is Nyquist rate. **10**

4. (a) If the FM wave is represented by the equation $V = 10 \sin [8 \times 10^8 + 4 \sin 1000t]$. Calculate :- **10**
 - (i) Carrier frequency
 - (ii) Modulating frequency
 - (iii) Modulation Index
 - (iv) Maximum deviation
 - (v) Bandwidth
- (b) Explain with the block diagram and relevant waveforms Adaptive Delta modulation? **10**
 How does Adaptive Delta modulation reduces slope overload error and Granular Noise.

5. (a) What is Multiplexing in communication system? Draw block diagram of TDM-PCM system and explain each block. **10**
- (b) Explain the concept of Image frequency and its rejection. Discuss double spotting. **10**

6. (a) Draw and explain block diagram of basic communication system. Explain different communication channels and their characteristics. **10**
- (b) Compare ASK, PSK and FSK systems. **10**

7. Write short notes on :- **20**
 - (a) Foster - seeley discriminator.
 - (b) Energy and power signals.
 - (c) Balanced Modulator.
 - (d) Explain Friis Transmission formula.
