

Seat No.	
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[4957]-1048

S.E. (Electronics/ETC) (Second Semester)

EXAMINATION, 2016

ANALOG COMMUNICATION

(2012 PATTERN)

Time : Two Hours

Maximum Marks : 50

- N.B. :-** (i) Neat diagrams must be drawn wherever necessary.
(ii) Figures to the right indicate full marks.
(iii) Use of logarithmic tables, slide rule, Mollier charts, electronic, pocket calculator and steam tables is allowed.
(iv) Assume suitable data, if necessary.

1. (a) For a baseband signal $m(t) \cos \omega mt$, find the DSBSC signal and sketch its spectrum. Identify the USB and LSB. [6]
(b) Sketch frequency Modulation (FM) and Phase Modulation (PM) waveform for the digital modulation signal $m(t)$, the signal given in figure 1.

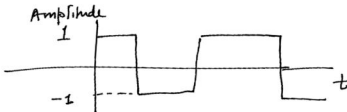


Figure 1

The constants k_f and k_p are $2n \times 10^5$ and $n/2$ respectively and $f_c = 100$ MHz. Calculate the frequencies present in the FM and PM waves. What is the limitation on the product $k_{pm}(t)$. [6]

Or

2. (a) Derive the equation for power efficiency for AM wave. What is the maximum efficiency for tone modulation ? [6]
- (b) Give the equation for FM and PM. Give the difference in BW bandwidth when :
- (i) Amplitude of modulating signal is doubled
- (ii) Frequency of modulating signal is halved. [6]
3. (a) Give the block diagram of superhet receiver. Draw the wave forms at each point in the block diagram. Explain its working in brief. [6]
- (b) In a radio receiver RF amplifier and mixer are connected in cascade. The RF amplifier has Noise figure of 9 dB and power gain of 15 dB. The mixer has noise figure of 20 dB. Calculate overall Noise figure for this cascade connection. [6]

Or

4. (a) For tone modulation derive the equation for upper limit of RC to ensure the capacitor follows the envelope of an AM DSBFC wave. [6]
- (b) Discuss thermal noise and shot noise in detail. [6]

5. (a) Explain the performance of SSBSC in the presence of Noise. [6]
- (b) Discuss the importance of Pre-emphasis and De-emphasis network in the performance of FM system. [7]

Or

6. (a) Derive SNR at the Receiver for Baseband system. Compare its performance with DSB-SC, SSB and AM. [7]
- (b) Explain the performance of FM system in the presence of noise. [6]
7. (a) Give the block diagram of DM Receiver and Transmitter. Give the distortions present in DM. How are they overcome ? [7]
- (b) Give the circuit for flat top sampling. Explain its working. [6]

Or

8. (a) With help of waveforms explain how PWM and PPM can be generated. [6]
- (b) State and prove sampling theorem in time domain. [7]