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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.

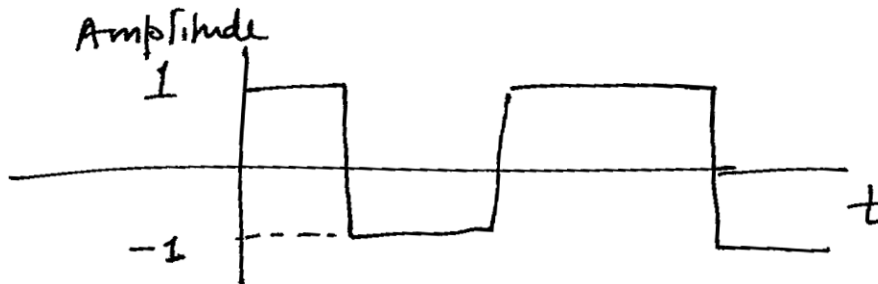


Figure 1

P.T.O.

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 $kpm(t)$. [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]