

ANALOG COMMUNICATION

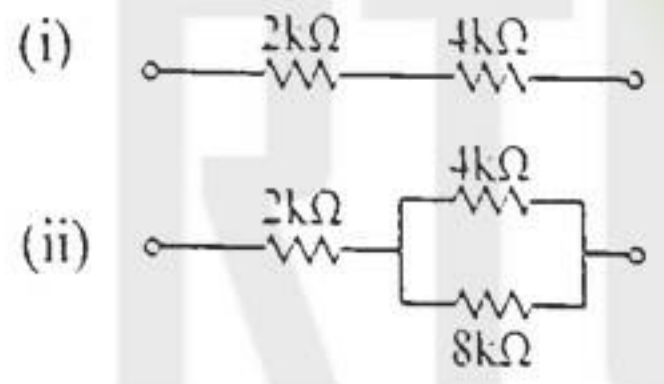
Time: 3 Hours Minimum Passing Marks: 30 Maximum Marks: 80

Instruction to Candidates

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)

Unit-I

1. (a) Calculate the total noise power in following circuits.



(b) Define equivalent temperature and find its expression in cascaded circuits. [4+4=8]

OR

- 1. Define following & find : (i) Noise bandwidth (ii) Noise figure (iii) Noise in reactive elements (iv) Noise in active elements [4x4=16]

Unit-II

2. (a) If a baseband signal x(f) = 2 sin 100t + 1.5 cos 300t is amplitude modulated with carrier signal y(f) = 10 sin 3 x 10^6t

Then:

- (i) Draw the frequency spectrum of AM signal (ii) Find the overall modulation index. [4+4=8] (b) Compare AM with following and find the % power saving : (i) AM-DSB (ii) DSB-SC (iii) SSB [8]

OR

- 2. Draw the following: (i) AM waveform when message signal is square wave & carrier signal sine wave. (ii) Super heterodyne receiver (iii) Circuit diagram for demodulate AM signal (iv) Generation of AM-DSB signal. [4x4=16]

Unit-III

- 3. (a) Draw the phases diagram of narrow and wide band FM. [8] (b) Compare AM, FM & PM in respect of (i) Bandwidth (ii) Noise effects [8]

OR

- 3. Draw & explain the working of : (i) PLL Demodulator (ii) Indirect FM Generation (iii) FM waveform when message signal is square wave & carrier signal is sine wave. (iv) Conversion of PM to FM [4x4=16]

Unit-IV

- 4. (a) Why we do pre-emphasis and de-emphasis? How it improves the signal to noise ratio? [8] (b) Write the name of any two sources of internal & external noise. Also write the frequency range of these noises. [8]

OR

- 4. Define the following & explain : (i) Threshold effect (ii) Synchronous detection (iii) Analog & Digital modulation (iv) Noise in CW and discrete systems. [4x4=16]

Unit-V

- 5. Draw the following & explain : (i) Natural & flat top sampling & scheme for achieving it. (ii) Circuit diagram of PWM Generation. [8+8=16]

OR

- 5. (i) Draw the circuit for PPM Generation and explain its noise performance. [8] (ii) Why natural sampling is impossible? Explain any sampling scheme in detail. [8]